bare land, available at the expiration of the present lease, which had four years to run, for the purpose of the erection of more modern buildings. Most of the architects and surveyors in Liverpool were called as witnesses, the lowest valuation on the part of the claimant being 3,390*l.*, and the highest on the other side being 2,654*l.* The jury, after a long hearing, gave a verdict for 3,000*l.* The claimant's interest in the premises was leasehold under the corporation of Liverpool, at a nominal rent, for seventy-five years, renewable on payment of a fine, and the amount awarded was at the rate of about 25*l.* per square yard.

SIR CHRISTOPHER WREN.

LAST week the Oxford Architectural Society visited, amongst other buildings in the City, the library of All Souls' College, and the drawings of Sir Christopher Wren, who was a Fellow of that Society, were inspected. The visitors were received by the librarian, Mr. Robarts, in the Law Library, recently erected under the direction of Mr. Bruton. Mr. Bruton briefly addressed the Society on the interest which attached to these drawings, as illustrating the office work as executed by architects of that period. He said there was no doubt many of the drawings were by the hand of Wren himself; others were those of his pupils, by one of whom the well-known twin towers in the large quadrangle of this college were designed. Among these drawings were several of St. Paul's Cathedral, and one for the re-construction of the streets of London, after the Great Fire of 1666. A plaster cast of the face of Sir Christopher Wren, taken after his death, was then shown to the visitors, who looked on it with much interest.

THE WASTE AND UNPRODUCTIVE LANDS IN THE CITY.

THIS important and rather serious subject came before the Court of Common Council on the 24th ult., in a motion by Mr. Isaacs.

"That the Coal and Corn and Finance Committee having in the years 1867, 1868, 1869, and 1870 called the attention of the Court to the large and increasing amount of unproductive lands in charge of the several committees of the Corporation, and the Court having ordered and obtained returns of the said unproductive lands, that it be referred to a Special Committee, to consist of the Chairmen of the City Lands, Bridge House, Markets, Improvement, and Markets Improvement Committees, and the Commission of Sewers, together with members of this Court, to confer with the said committees and commission, and to inquire into the present system of letting and disposing of such lands; and to consider and report whether any, and if any what, changes are desirable in respect thereof."

In the report which was presented last month, said Mr. Isaacs, it was stated that for some years the Corporation had been constantly adding to its surplus or unproductive lands, and had undertaken large bonded debts in respect of them. What was the cause of this? Not the slackness of trade, nor the tightness of the money market. Possibly the restrictions they imposed as to the kind of property that might be built were too many. Or, perhaps, they estimated the value of their land at too high a rate. The motion was carried in the face of an amendment to refer it to the four permanent committees mentioned in the resolution. The blank in the motion was then filled up with the number 12, and the committee was appointed.

INFIRMARY, BASFORD UNION.

SIR,—You will oblige by inserting the following statement:—

The undermentioned firms, all of Nottingham, were contractors at the above Union, in addition to Mr. G. Hopewell:—

Messrs. Dennett, fire-proof arches; Messrs. Danks & Nixon, fire-place blowers (designed by the architect), ventilating fire-grates, stoves, and baths; Messrs. Griffiths & Son, scullery ranges, hot-water cisterns, boilers, and two double hoists; Hopton Wood Stone Company, chimney-pieces; Mr. Hewitt, hot and cold water service, portable bath, and gasfittings.

The following were sub-contractors, all of Nottingham:—

Mr. Shipston, stone-masonry; Mr. Hewitt, plumbing and glazing; Mr. Doubleday, slating; Mr. Mundy, plastering; Mr. Rawlinson, iron-founding; and Mr. Barton, of Basford, painting.

Mr. R. Hancock, filled the office of clerk of the works.

H.

CHURCH-BUILDING NEWS.

Carlisle.—The old Church of St. Mary, Carlisle, has been removed from its old habitation in the nave of Carlisle Cathedral. The galleries have been taken down, the ceiling has been removed, thus bringing into view the Norman arches near the roof, and preparations are being made for restoring the place to something like its pristine beauty. In the lath and plaster windows and the damaged piers are now plainly seen the traces of the barbarous taste of those who robbed the cathedral of one of its most interesting parts. The work of restoration will now proceed, the nave remaining in the meantime screened off from the cathedral transept.

Tattenhall.—The parish church of St. Alban, Tattenhall, has been reopened after extensive alterations. Shortly before the death of the late rector, the Rev. Fielding Ould, M.A., it was resolved, in consequence of the dilapidated state of the building, to have it completely restored. About twelve months ago the work was commenced under the direction of Mr. Douglass, architect, Chester, the contractor being Mr. G. Woollams, builder, Tattenhall. With the exception of the tower and the side walls, the building was entirely pulled down, and the work of enlargement and restoration commenced. The space formerly occupied by the old chancel was included in the main body of the church and extended in breadth, and a new chancel was built at the eastern end. The church, as it is now built, consists of a tower, a nave with side aisles, an organ-chamber and vestry, a lady chapel, and chancel. The tower is a square, embattled structure of stone, built in the reign of Henry VI. or Henry VII., and contains a peal of five bells. From the level of the leads, project short grotesque gurgoyles, and two empty niches, probably once containing figures of St. Alban and the Virgin Mary, occupy prominent positions above the new oaken door. Inside the tower is open up to the roof of the nave, but a screen of varnished pine, panelled with lights of coloured glass in geometrical devices, conceals the ringers from the view of the congregation. The west, or tower, window is of stained glass, the subjects being Scriptural. It was the gift of Mr. R. O. Orton, churchwarden. A stained-glass window, representing scenes in the life of Christ, is placed at the south side of the tower, and is the gift of Mr. J. Stephens and pupils. The nave is divided from each side aisle by four arches springing from pillars. The roof of the nave is supported by four principals, which, as well as the rafters, are of varnished pitch pine. The nave roof has been raised about 10 ft. from those of the side aisles, and in the intermediate walls on each side four clearstory windows have been pierced. The windows on each side of the aisles have been renewed. The old box pews have been replaced with open ones (a portion of which only are free), which are calculated to accommodate 500 persons. The walls not pulled down were redressed in the interior. The organ-chamber and vestry are on the north side of what was formerly the chancel, and form a sort of north transept, while a similar transept, called the Lady Chapel, is on the south side. The new chancel is raised, and in the centre is set with encaustic tiles. The foremost pews are more decorated than the others. The eastern window has been presented as a memorial of the late rector, the Rev. F. Ould, by his friends. It is of stained glass, and the principal subjects it illustrates are the Crucifixion and scenes in connexion therewith. In a window at the south of the chancel the stained glass which was formerly in the east window is replaced. The new porch at the south-eastern end of the church has been given by Mr. Brodbelt, merchant, of Liverpool and Tattenhall. Panels of parian are framed around by oak beams crossing one another, and in some places richly carved. Each side of the porch is pierced for three Gothic stained-glass lights. In this, as throughout the whole of the restoration, the character of the Perpendicular style of Gothic has been preserved. The cost of the restoration is about 3,500*l.*, of which over 3,000*l.* have been already subscribed.

Marple.—The new church dedicated to St. Martin, situated on the Brabins Hall estate, near to the Marple railway station, and erected at the cost of Miss Hudson, of Brabins Hall, has been consecrated by the Bishop of Chester. In the east window are representations of the Twelve Apostles, and in the centre is a representation of the Crucifixion. In a large niche on the north side is an organ, with two sets of keys, cost about 250*l.*, presented by Miss Stevenson, Cotefield, Marple. A new school adjoining has recently been built by Mrs. Hudson, of Brabins Hall.

Crowborough. — The Chancel of St. John's Church has been consecrated. The new chancel is of an oval shape, the roof of wood; it is lighted by five lancet windows of stained glass; that over the altar is by Clayton & Bell, representing the Crucifixion of Our Lord. The windows on either side are also by Clayton & Bell; the one to the left is an effigy of St. Elizabeth, while that to the right represents the patron Saint of England, St. George. The other two windows are of Munich glass. There are other stained-glass windows in the chapel.

Chadlington.—The work of restoration in the church is now approaching its termination, the whole of the nave and chancel being already complete. Many coats of whitewash have disappeared from the walls, pillars, and roof; the ancient gallery has been removed, and an arch opened up into the tower; the ancient lounging boxes, called pews, have given place to modern open seats; the uneven flags in the floor are replaced by red tiles; and instead of the stove, with its yards of pipe, the whole of the church is heated by a combined system of hot-water pipes and hot air, the heat entering the church through gratings in the floor. In the chancel an organ-chamber and vestry have been added to the south side, and two new windows to the north side, the floor being laid with coloured tiles. New choir seats, in carved oak, have also been provided. The architect employed in the restoration is Mr. Buckeridge, of Oxford and London, the details of whose designs have been carried out by a local contractor, Mr. A. Groves, of Milton-under-Wychwood, under the superintendence of the foreman, Mr. Thos. Smith. The cost of this work will be about 2,000*l.*, which sum has been raised from the following sources:—The Earl of Dacie over 1,400*l.*; St. John's College, Oxford, 200*l.*; collected from parishioners, 144*l.*; Diocesan Society, 60*l.*; other contributions, including balance in Churchwardens' hands, 200*l.*

Ipswich.—For many years past the church of St. Mary-le-Tower, Ipswich, has been in the hands of the builders. A townsman resolved some years ago to restore the church in a manner worthy of the great wealth and undoubted art resources of the England of the present day. The works have been carried out under the supervision of Mr. R. M. Phipson, architect. Although the church has been nearly rebuilt, the services in it have never been entirely stopped. When the structural portions of the church were reared the enrichment was one of the portions of the work left for future treatment, and the corbel-heads, key-stones of the window arches, friezes of the doorways, and dripstone terminations, were put in in blocks, and left to be carved *in situ*. It is this work which has now been finished. The workmen employed are from the studio of Mr. Phyffers, the artist employed for several years past in the restoration of the sculptured work in Canterbury Cathedral. The most prominent amongst these works is in the west doorway, where a carved frieze surrounds the door: it represents the vine leaves and fruit upon a circular bole with here and there a bird, as accessory to foliage. On each side of the doorway there springs a crocketed pinnacle, having three grotesque animal forms at each of their bases. The south doorway in the tower is enriched by carved heads of the Queen and the Bishop of the diocese, as dripstone terminations: the former of these is on the west side, and the latter opposite. The inner door has a representation of the Annunciation in the angel Gabriel with uplifted finger, on one side, and the Virgin on the other. The capitals from which the mouldings spring have representations of the bramble and thorn. Over the turret staircase door is a corbel with columbine foliage, and a carved grotesque animal. In the interior of the church the principal carvings are the corbels for the springers of the nave of the roof. These represent the English saints, and are carved on a scale sufficiently large to show the features, and the minutest emblems. They are Saints Alban, Augustin, Oswald, Ebbs, Etheldreda, Chad, Cuthbert, the Venerable Bede, Swithin, Edmund, Alphege, Edward the Confessor, Anselm, and Hugh. Between each of these is a foliage corbel. In the north and south aisles are corbel heads representing angels with musical instruments, or in acts of adoration; and here, again, these are alternated with foliage corbels, the thorn, oak, rose, ivy, dahlia, primrose passion-

flower, arum, columbine, and other plants, being represented. Nearest the chancel are the heads of the four Evangelists. The style of the work is the Decorated, but much modernised in some details.

DISSENTING CHURCH BUILDING NEWS.

Ipswich.—The memorial stone has been laid of the new building now in course of erection for the accommodation of the English Presbyterian Church, which has been formed in Ipswich within the last two or three years. The site is on the Burlington estate, with a principal frontage on the wide open space at the junction of the Norwich and London roads, and also having frontage on Mill-lane and the Burlington-road. Mr. Frederick Barnes is the architect. Mr. H. Luff is the contractor, the amount of the contract being 2,897*l*. The walls have reached a height of upwards of 20 ft., and the delay in laying the memorial stone has arisen from the circumstance that the arrangements of Sir A. S. Adair, who undertook to perform the ceremony, did not permit of his being in Suffolk before. The church stands east and west, and consists of what, in Episcopalian architecture, would be called a nave, with an apse at the western end, in which will be the platform for the minister, 78 ft. in length, and 38 ft. wide, and north and south transepts at the west, giving the building at that part a width of 58 ft. At the north-eastern corner will be a square tower, surmounted by a spire of Bath stone, rising to a height of 125 ft. from the ground. It is proposed that a clock should be placed in the upper part of the tower facing the barrack corner. The walls are faced with Kentish rag stones, with Bath stone-dressings, and the style of the building is Decorated. At the east end there will be two entrances, one by the tower, and the other by a porch in a corresponding position on the south side; while in a turret at the north-west corner of the tower is an entrance and circular staircase leading to the gallery across the east end of the church, the first floor of the tower forming a lobby to the gallery. There are also entrances to the floor of the church at the west end, and both there and at the south-eastern porch separate entrances and staircases are provided, which will give admission to north and south galleries if added at any future time. The roof will be open, with double hammer-beams and arched principals; the height from the floor to the ceiling (the small space between which and the apex of the roof will be used for ventilating purposes), will be 40 ft. The eastern gable will be 56 ft. high to the top of the pinnacle with which it will be surmounted, and the gables of the porches will be 20 ft. high. The platform for the minister will be in the apse at the west end, beneath it being a small room which will be used as a vestry, and which will communicate by a staircase with the platform. The church will be benched, and there will be sittings for upwards of 500 persons, and should further accommodation be required, side galleries can easily be added. The roof will be divided into three bays, the walls being supported externally by buttresses in corresponding positions to the principals of the roof. In the north and south walls there will be three two-light windows, broken by transomes as a relief to their height. In the eastern gable will be a five-light window, with three single-light windows below it, and in the transept gables will be two three-light windows resembling those in the north and south walls. Ample apparatus for warming the church is to be provided. Mr. Barnes's plans include school-buildings, having a frontage on Burlington-road, but for financial reasons these at present are not to be carried out. A school-room, 22 ft. square, with four class-rooms, is contemplated on the ground floor, and a large room over, on the first floor, available for school and church purposes. These rooms are to be in communication with the church, and a vestry will also be provided.

New Hampton (*Middlesex*).—The new Congregational Church here has been opened for divine service. The ground was the gift of two ladies, and has a depth of about 106 ft., and a frontage of 66 ft. to the road between Twickenham and Hampton, giving sufficient area for the erection of church and schools. At present the former only has been undertaken. In a limited competition of architects, the plans by Mr. Benjamin Tabberer were selected. The church is in the Gothic style of early character, and is of brick, with Bath stone dressings, bands of red brick and blue Bath stone being occasionally introduced. The internal dimensions are 56 ft. 10 in. by 35 ft. 11 in., with a porch in front 23 ft. 8 in. by 5 ft. 6 in., vestry in rear 13 ft. by 10 ft., &c. The height from ground to ridge of roof is 44 ft. The edifice contains sittings for 312 persons, but as it is 18 ft. high on the side walls above the floor line, there is sufficient space to admit of the erection of an end gallery to contain 100 more if found desirable. The principal front has a large four-light traceried window, and a spirelet covering the gable, which latter serves also as a ventilator to the church. The porch has two entrances, and a three-light window between. The side windows are of two lights with cusped heads. At the end of the church, above the pulpit, is a quatrefoil circular window, proposed to be filled with stained glass as soon as funds will permit. The roof is open-timbered and stained. The seats are open benches stained and varnished. The pulpit or platform is of ornamental character, and approached by stairs at each side. The building will be warmed by two of Gurney's Gill stoves placed nearly in the centre of the side walls, and lighted by star burners suspended from the principals of the roof. A dwarf wall with ornamental iron railing and gates separates the ground from the road. The contractors for the works were Messrs. Dove. The total outlay will be about 1,500*l*.

Southsea.—The memorial-stone of a new Congregational Church for Southsea has been laid, on an open site on the common. The church, which will accommodate upwards of 670 persons, will consist of nave lighted by clearstory, east and west aisles and transepts, and an apse. Arrangements for the organ-chamber have been made on the east side. The walls will be of Isle of Wight bricks and hammered flints, with Bath stone dressings; internally with red and white brick bands and quoins, and the intermediate spaces being stuccoed. The north entrance, facing the Kent-road, will have a portico attached to the tower and spire, the foundations of which only will be put in at present. There will be two other entrances on the east side. The design is Early English, of the latter part of the thirteenth century. Schools and vestries adjoining the south side were erected two years ago. Mr. Stent, of Warminster, is the architect. Mr. A. Smith, of Portsea, the contractor.

Launceston.—A new Wesleyan Chapel has been opened here. The edifice in style is Gothic, of the geometrical period, and it consists of a nave, side aisles, transepts,—with organ-chamber in one of them,—and a small apsidal chancel. The aisles are divided from the nave by pillars and arches, which support a clearstory, pierced by two-light windows on either side. At the north-west angle and detached from the main structure is the tower, which, with its spire, rises to the height of about 110 ft. The principal front towards the street presents the triple doorway of an open and recessed porch, the openings separated by grouped pillars of polished Aberdeen granite, from the carved capitals of which spring pointed and moulded arches of Cornish grey granite. Over this doorway is a large four-light window, with clustered pillars between the lights and at the jambs, and moulded tracery in the head. Above this rises a gable coped and pinnacled. The aisles have sloping roofs, and are lighted by series of two-light windows. The transepts terminate with gables pierced by three-light windows. Each of the three sides of the chancel has a two-light window, with detached pillars having carved capitals, and filled in with stained glass of geometrical pattern by Bell, of Bristol. All the other windows are filled with cathedral glass. The chapel will seat about 700 persons in open pews, constructed of pitch pine, and there is a small gallery for children at the north end. The chancel and all the passages are paved with Maw's tiles; and the walls of the former to the height of 3 ft. are also lined with tiles of chocolate colour and encaustic band in which the passion flower is conventionally introduced. Between the tile dado of the chancel walls and the window sills, the wall surface is to be painted in panels from the architects' designs by Mr. Harris, of Plymouth, but this portion of the work is not yet completed. Here also will be introduced the decalogue and texts. All the roofs are open to the collar-beam. The walls of the structure are built of local stone, Bath stone, Portland stone, and granite, and the angles of the spire are of wrought limestone. The carving, which is conventional, has been done by Mr. Harry Hems, of Exeter. The Plymouth Foundry supplied the ornamental castings for the gallery front. The general contractors were Messrs. Blatchford, of Tavistock; and the architects, Messrs. Hine & Norman, of Plymouth. Adjoining the chapel are a large school-room, infant school, six class-rooms, and minister's vestry; and in these portions of the works the stone dressings from the former chapel have been to some extent introduced, which will account for a difference in the style of the church and school buildings.

Books Received.

Handbook for Shropshire, Cheshire, and Lancashire. London: JOHN MURRAY, Albemarle-street. 1870.

MR. MURRAY has increased the obligations due to him from the travelling public and the inhabitants of the counties illustrated, by the publication of this guide to Shropshire, Cheshire, and Lancashire,—counties that include a vast deal of interesting matter. The preface says justly that a handbook which embraces such a large section of England as this does, extending from the South Welsh mountains to those of Cumberland, from the Severn nearly to the Solway, must needs contain some inaccuracies, and especially in the manufacturing districts, where changes occur so much more rapidly than in others. The editor asks, therefore, for any additions or corrections that can be afforded him. Dipping here and there into the book, we find his fears are not wholly without ground, and that the next edition may be improved by careful review of this. Amongst the slips are some architectural errors, such as the statement touching Furness Abbey, that the style of the abbey "was Early English; but as additions were made to it, as its wealth increased, it gradually assumed a mixed character, known as Transition;"—"the *Town-hall* at Manchester is after the Erechtheus at Athens," and so on. Liverpool architects will be surprised to find the *Custom-house* there instanced as one of the noblest architectural works of the age (p. 259), it being one of the dreariest masses of dead-looking ashlar work that can be imagined. The *Exchange* is described as being "much altered and enlarged by Wyatt" (p. 260), and "Wyatt" also is named as designer of the Nelson monument: with nothing to show that they are not the same man, and that the Exchange is a *new* building. The statement (p. 256) that in gales the steamboat communication with Birkenhead is stopped is erroneous, except in very rare cases: an old inhabitant tells us during fifteen years' dwelling on the Cheshire side he only remembers the traffic once entirely stopped, and that was by a fog, and was censured as showing unnecessary timidity on the part of the ferry managers.

It may be worth mention that the *Gallery of Art* (p. 261) was pronounced by Waagen to be one of the finest and most interesting collections of *early* painting in the world. The tympanum of the great portico of St. George's Hall is said to have "a group of figures in Caen stone, by Cockerell." It should be *designed* by Cockerell.

The remarks about Chester and Birkenhead seem very full and correct in the main. St. Mary's, Birkenhead, was one of Rickman's designs, which should be mentioned. Hamilton-square (Birkenhead) is much over-praised; people are giving up their houses there now to go up to the suburbs (*Claughton*, and *Oxton*, and the Park). No mention is made of the Claughton district on the rising ground about a mile and a half from the river, which is one of the pleasantest residential suburbs we know of anywhere near a large town, and has some capital houses.

In the account of Manchester we find no mention of the Albert Memorial there, precursor as to form on a small scale of the remarkable piece of monumental jewelry in Hyde Park, now approaching completion; and it would be as well in speaking of the memorial groups in front of the Royal Infirmary, to give the names of the sculptors. And as to names, we miss in the interesting list of "celebrated men who have been born in or are identified with the history" of Lancashire, that of Richard Cobden. Passing to Haughmond Abbey, Shropshire, the figures in the jambs of the Norman doorway should not be described as "*placed* there subsequent to the building of the arch," but as *sculptured* there. We would add some other notes, such for example that in the account of Todmorden (Lancashire) no mention is made of Dobroyd Castle, the residence of Mr. John Fielden, but it might seem that we were seeking to pick holes, which in truth is not the case.

The guide-book commences with some very

useful introductory essays on the physical geography, geology, industrial resources, means of communication, history, and antiquities of the three counties, with lists of the various places of interest deserving a visit, and skeleton tours to be varied according to pleasure.

VARIORUM.

Hardwicke's *Science Gossip* continues to bring much interesting and curious matter before the lovers of nature. The November number contains information as to the Birds of Paradise, the eggs of butterflies, with curious illustrations, and various other interesting matter.——"Elementary Arithmetic: part II. By Richard Rickard. Cassell, Petter, & Galpin." Mr. Rickard ought to be a competent writer on arithmetic, as he seems to be, for he is assistant mathematical master in King Edward's School, Birmingham. ——"Some Points in the Physiological and Medical Aspect of Sewage Irrigation. By Alfred Carpenter, M.D. Hardwicke, Piccadilly." This is a second edition of a paper read at the Social Science Congress, at Bristol, in October, 1869; and contains notes on the recent evidence adduced against irrigation in the Houses of Parliament, &c., to which is also appended a paper on the influence of sewer gas on the public health. A desire for further information upon the effects of sewage irrigation in the neighbourhood of Croydon, has led to the revisal and republication of Dr. Carpenter's paper. —— "Cardiff Free Library, Museum, and Schools of Science and Art. Eighth Annual Report, 1869-70." The number of issues from the Cardiff library during the year has been 17,871 volumes, which shows that there has scarcely been any increase upon the issues of last year. The result is due to the small number of new works added, and the want of a proper catalogue. The rapid growth of the Schools of Science and Art has necessitated their removal from St. Mary-street to the Cardiff Arcade, where commodious rooms have been rented. ——The Palestine Exploration Fund managers have issued a preliminary report of a journey through the desert of the Tih and the country of Moab, by Mr. E. H. Palmer, M.A. The report is mainly promissory, however, as well as preliminary. Mr. Palmer intimates that he and Mr. Drake may be said to have performed their journey absolutely unattended and alone. They went to Dhibàn, and searched carefully among the broken fragments of the Moabite stone which are still lying there; but every piece with writing on has been either destroyed or removed. Mr. Palmer tells a curious and romantic legend connected with Jerusalem:—

"It is a curious fact that the guardian of the Aksa Mosque (whose ancestors once had the care of the entire Haram, until they were supplanted by the Denef family in the custody of the Cubbetes Sakhrá) declares that his father, when dying, indicated to him a spot within the sacred enclosure where an iron chest full of ancient books lies buried, and adds, that from the oldest times each successive sheikh has revealed the fact to his son as the ay of his death drew nigh."

As Mr. Palmer remarks, valuable books have been so preserved for centuries in the East. The ancient Jews also buried rolls of the law in earthen pots for safe keeping. He thinks the Palestine Fellahin should be talked to as to such matters. Mr. Drake supplements the report with remarks on the stone circles of Ragb el Mirad. Similar enclosures, he says, are still in use as foundations for thorns as hedges surrounding camps, to keep out the wild animals.

Miscellanea.

New Brewery, Swindon.—A new brewery is in course of erection, constructed, it is said, upon very economical and scientific principles. It stands near the High-street, and covers about 2 acres of land. It is capable of brewing over 2,000 gallons daily, with only one engine and one boiler (double flue: 14-horse power), which consumes not more than half a ton of slack per day. The building throughout was undertaken by Mr. Phillips, of Swindon, who worked from the architectural designs of Mr. Arthur Kinder, of London. The machinery was constructed by Mr. Llewellyn, of Bristol; and the vats, &c., were made by Mr. Oxley, of Frome, and Mr. Bridle, of London. The brewery has now been finished, and a supper has been given by the proprietor, Mr. Bowly, at the Masons' Arms Inn, to the whole of the men that were engaged in its erection, together with a few friends.

Edinburgh Architectural Association.—At the first ordinary meeting of the session, held on the 13th ult., Mr. Thomas Ross, vice-president, in the chair, the President for the current year (Mr. R. Morham, jun.) read a paper "On various Defective Internal Arrangements of Dwellings." He referred at some length to the subject of the ventilation of dwelling-houses, pointing out that, while it was usual at the present day, in the case of most public buildings, to make some provision for this important function, in the case of dwelling-houses it was most frequently quite overlooked, and made to depend very much on the want of fitting about doors and windows; and then went on to show that it was not enough for the architect that his employers were indifferent to such matters, but that it was his duty in all cases to endeavour to impress on them the duty of giving effect as far as possible to the dictates of modern scientific research, and that the mere indifference to the importance of proper ventilation was no reason why it should not be pointed out by him on all occasions as a very necessary thing. One subject referred to was that of water supply, or rather the waste of water, which, he thought, could most effectually be checked by the use of meters, but admitted that there were serious difficulties in the way of their introduction. The question as to the best kind of water-tap, and the case which was tried in the Sheriff Court a few years ago, wherein the relative merits of the ground-plug and screw-down principles were very fully discussed, were then alluded to, and a portion of the evidence in that case was quoted to show that in the towns of Manchester and Norwich the introduction of the screw-down tap had reduced the quantity required per head per day from 38 or 40 gallons to from 13 to 15, which was found amply sufficient for all domestic purposes.

Instruction in Science and Art for Women.—Professor Huxley delivered the sixth of his series of lectures on "Physiography" to a numerous audience in the lecture-room of the South Kensington Museum, on Saturday morning, when he continued his observations on the plutonic and vital agencies that are at work in repairing the waste of dry land which is constantly going on in the various forms of denudation previously described. The seventh lecture was delivered on Wednesday. There was a numerous attendance. The lecturer continued his observations on the "vital" as distinguished from the "plutonic" agent at work in repairing the waste of dry land occasioned by the various forms of denudation. Professor Guthrie delivered the fourth of his advanced course of lectures on heat and light, in the lecture theatre. Having in his previous lecture spoken of the capacity of heat in different substances, the Professor now proceeded to consider how it is that some substances have greater melting powers than others, as was previously illustrated, to some extent, in the melting of wax by bringing up the different substances to the melting degree of temperature; and how it happens that different substances having the same temperature may not possess the same amount of heat. The fifth lecture of his series proceeded to examine and illustrate still farther the subject of heat. The first object of illustration was ice, upon which some interesting experiments had been made in the course of the preceding lectures.

A City Lighted by Natural Gas.—The city of Erie, Pennsylvania, stands on the verge of the petroleum region. Natural gas is formed in large quantities beneath the surface in this region, and it has been turned to account for illuminating purposes. On the night of Oct. 26 the city of Erie was lighted by natural gas, obtained from a well sunk near the city gas-works. Thirteen gas-wells are said to be now in successful operation in Erie, and are mostly used to furnish fuel and light to factories. The gas is found at an average depth of 550 ft., and the yield per well is about 20,000 cubic feet a day. The gas is said to require no purification, and is being introduced into private houses for fuel.

A Church Spire Damaged.—The village of Hartfield has been visited by a severe thunderstorm, which did serious damage to the church. The lightning struck the ball at the top of the vane, split the top of the spire, ripped out the shingles and some of the timbers on the south side, and some of the stones on the top of the tower. The whole of the spire, in fact, is so severely shaken, that much of it will have to be removed before it can be repaired.

Lectures by the Rev. Canon Kingsley. The extraordinary cerebral activity of the Rev. Canon Kingsley may be slightly appreciated by an announcement which he lately made before delivering a lecture, at Chester, "On Wind and Rain." "I wish, next spring, to give to those who did me the honour of attending my botanical class last spring, some plain lectures on geology; but not merely on geology. As I said last night at Liverwool, you cannot study one natural science without being forced to study at least a little of three or four more; and therefore I should prefer calling those lectures, lectures on natural history, that is, the history of our planet; at least, the history of its surface, on which we live; lectures on what the Germans call *Erdkunde*—earth-lore, earth learning which I hope to see some day taught in every school in the British empire. I think of giving a set of lectures on the very simplest matters; to begin, I think, with the soil in the field; then go on to the cobbles in the street, to the stones in the wall, the coal in the fire, the lime in the mortar, the slates on the roof; and so to lead you (as I ought to be able to do) through the whole geology of this district. And meanwhile, it is fit that I should give you, as an introduction to these lectures, a little talk about wind and rain; for, as you will see, I hope, in time, to show that without wind and rain there would have been no soil, no cobbles, no sandstone, no coal, no lime, and no slates, and (as I may show you in some future course of lectures) no reptiles, animals, or men either. Let us begin with the wind."

Parliamentary Bills.—Amongst the Bills in Parliament Session 1871, will be one for purifying the water and giving a constant water-supply to London, for the control and regulation, amalgamation, &c., of the several companies, reduction of rates, and other cognate purposes. There will be a Bill for the enlargement of Billingsgate Market, purchase of adjoining land, &c. Another Bill is for the acquisition of additional ground, &c., for the Record Office in the Liberty of the Rolls. There is a Bill titled the "Euston, St. Pancras, and Charing-cross Railway," for the construction of railways from the London and North-Western Railway at Euston Station and the Midland Railway near St. Pancras Station to the Charing-cross Railway at Charing-cross, and streets between Oxford-street and Leicester-square, and between Leicester-square and Castle-street. Another for the incorporation of the "Fulham, Hammersmith, and City Railway" Company, for a line commencing with a junction with the Hammersmith and City Railway, in the parish of Hammersmith, near the Hammersmith Terminus, and terminating in the parish of Fulham, at a point on the northern side of the King's-road, where the tablet bearing the inscription "Elysium-row, Anno Domi., 1738," is let into the front of the houses.

Sanitary State of Wells.—For some months past an agitation has been going on about the necessity of the local board obtaining a better supply of water. The board refused to do so, but sanctioned the formation of a private company, of which General C. C. Pratt is the chairman, and Mr. Welsh the solicitor. Before this consent had been given by the board, a memorial (in pursuance of the 49th section of the Sanitary Act, 1866), was signed by several of the principal owners and ratepayers, praying inquiry as to the default of the local board. An inquiry has accordingly been directed to be made, the commissioner appointed for the purpose being Mr. Arnold Taylor, who intends to proceed upon the said inquiry on the 15th instant, at the Town-hall, Somerset.

The Property of the Metropolitan Railway Company.—In reply to the offer of premiums by the Company for the best plan for utilising their surplus property, about 300 plans were submitted. The lands are at Farringdon-road, Barbican, King's-cross, Bagnigge Wells-road, Edgware-road, Praed-street, Linden-grove, Campden-hill, Smithfield, and South Kensington. The Farringdon-road estate is valued at about 350,000*l.*, and that of Smithfield at 150,000*l.* We do not hear that any decision has yet been come to.

India.—An archæological committee has been appointed in Ceylon to investigate the ruined sacred cities, and to collect inscriptions. Several ancient cities have been cleared of jungle, and many unknown antiquities have come to light. Photographs have been taken of the ruins of Anuradhapura.

Public Hall for Harrow.—It is proposed to form a joint-stock company, under the Limited Liability Act, for the purpose of erecting a public hall in Harrow. A site in the High-street, nearly opposite the King's Head Hotel, has been secured on advantageous terms, at a ground-rent, with the option of purchasing the freehold within a period of seven years. On the first floor of the building, according to the design, are the main hall, with gallery, capable of seating 600 persons, orchestra, platform, two retiring-rooms, ladies' and gentlemen's cloak-rooms, and also a refreshment or club room. On the second floor are four rooms for the use of an attendant, &c. The estimated cost of the building, including architect's charges for plans and superintendence, is 2,000*l.*, which it is proposed to raise in 2,000 shares of 1*l.* each, 5*s.* per share being payable on allotment (on the formation of the company), and the remainder by instalments as required.

Danger from Union of Metals.—Some time ago, at the Institution of Engineers in Scotland, Mr. Clinkskill exhibited several pieces of boiler plates cut out of destroyed boilers for supplying houses with hot water; the boilers were used with Loch Katrine water. The action on the plates was evidently due to a more active agent than ordinary corrosion, the surface of the plates being irregularly honey-combed to a considerable depth. In the case referred to, the cistern was of lead, the boiler and connecting pipes of iron, thereby forming a galvanic battery, sufficient to account for the destruction of the plates. From the experience obtained, it appears advisable that in the construction of such hot-water apparatus, the cistern, boiler, and the connecting pipes should all be of iron, or, at least, of one kind of material.

New Altar Space in York Cathedral.—A new altar space has been erected in the sanctuary of York Minster. In length it is 17 ft. 6 in., and in breadth 6 ft. 6 in., and it is erected immediately adjoining the stone altar screen. The framework or step has a rise of 8 in., and is of white Sicilian marble. The entire area within is laid down with encaustic tiles and coloured marbles, that portion upon which the altar-table rests, and which is not exposed to view, being of plain maroon-coloured glazed tiles. The marbles used are Egyptian green, Belgian red, Sienna, Silesian, and white statuary. The designer is Mr. Street, and the execution of the work has been completed by Mr. Earp.

The Wellington Monument, St. Paul's. We hear, with equal surprise and regret, that the Chief Commissioner is inviting tenders from sculptors for the completion of Mr. Stevens's monument. It is impossible wholly to exonerate Mr. Stevens from blame in this matter; but to suppose that any one but himself can satisfactorily complete his work is nonsense, and we suppose few sculptors will be found willing to attempt it. When Dickens died, leaving his last book unfinished, Chapman & Hall might as well have advertised for some one to finish it. A proper arrangement ought at once to be made with Mr. Stevens himself.

Kind Feeling.—An interesting meeting took place on Friday evening, November 24th, at the Sun Inn, Westminster Bridge-road, when the masons working at the new St. Thomas's Hospital presented to their head foreman, Mr. James Williams, a handsome case of mathematical instruments, as a testimonial of their esteem and appreciation of his abilities and upright conduct whilst carrying out the work, and for his general candid manner with the men under him. Such recognitions are honourable to all concerned.

Entertainment.—Mr. A. Bell (of the firm of Clayton & Bell), of Bayford House, Hampstead, entertained, on the 22nd ult., some twenty workmen engaged with Mr. W. H. Watts in erecting an ornamental addition to the house, under the superintendence of Mr. Charles Buckeridge, architect. A repast, at seven o'clock, was partaken of with acknowledgment, after which toasts and harmony filled up a pleasant evening.

Knighted Architects.—The expected addition to the list has been made. On Tuesday last her Majesty the Queen conferred the well-deserved honour on Mr. Pennethorne. We heartily congratulate Sir James Pennethorne on this recognition of his services, and with sincerity wish him long life to enjoy his retirement.

The Victoria Embankment.—The approach to the Victoria Embankment by way of Arundel and Norfolk streets, Strand, has, after considerable delay, been completed so far as to admit of its opening in a few days from Arundel-street, which is now being repaved with the view of facilitating the access from that street.

Penrith.—A meeting has been held with a view to building a covered grain-market for Penrith. Arrangements were made to learn the opinions of the Duke of Devonshire on the subject.

TENDERS.

For No. 1 Contract for sugar refinery, Love-lane, Liverpool, for Messrs. Henry Tate & Sons. Mr. W. J. Mason, architect. Quantities by Mr. G. Northcroft:—

Kirkham	£5,467	0	0
Litt & Wilkinson	5,279	0	0
Tomkinson	4,968	0	0
Readdil	4,966	0	0
Nicholson & Ayre	4,867	0	0
Burroughs	4,863	0	0
Roberts & Robinson	4,730	0	0
Holme & Nicol	4,747	0	0
Urmson	4,704	0	0
Rome	4,657	0	0
Haigh & Co. (accepted)	4,637	0	0

For an Ionic temple and terraces, and works to ornamental grounds, at the seat of the Earl of Strafford, Wrotham Park, Herts. Messrs. Shrubsole & Stewart, architects:—

Goddard (accepted)	£922	0	0

For Waterloo-wharf, stables, counting-houses, &c. Mr. G. Loe, architect:—

Hill, Keddell, & Waldram	£1,850	0	0
Mareland & Son	1,650	0	0
Conder	1,597	0	0
Manley & Rogers	1,537	0	0
Woodward	1,509	0	0
Henshaw	1,497	0	0
Crabb & Vaughan	1,494	0	0

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We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

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THOMAS BEASLEY, Law Clerk.
St. Helen's, 10th November, 1870.

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ARTHUR ALEX. CORSELLIS, Clerk to the Board.
Battersea-rise, S.W. December 1, 1870.

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The Builder.

VOL. XXVIII.—No. 1453.

New Buildings for the 1871 Exhibition, and the Royal Albert Hall.

THE buildings erected for international exhibitions by the commissioners for the Exhibition of 1851 are now so far completed that little remains to be done beyond the tile pavements in some of the galleries. Our readers may remember that the new buildings flank the arcades on the east and west sides of the Royal Horticultural Gardens, and are joined by means of a glass-covered way on the arcades at the north end of the gardens, communicating with the conservatory and the Royal Albert Hall of Arts and Sciences. We subjoin a view* showing the appearance of the buildings above the arcades; also a view of the Hall, the roof of which, as finished, is somewhat different from what was shown in the view we published some time ago. In an early number we will give a plan, showing more clearly the connexion of the various buildings. When the scheme is completed, it will form a remarkable whole. The galleries now finished are in two stories, about 550 ft. in length, besides the staircases and side galleries extending east and west, and are 30 ft. wide. The lower story, coloured pale green and chocolate, has side lights; and the upper, the walls of which are also of pale green, a central skylight. From the latter there will be a way to a promenade formed on the top of the arcades, and overlooking the gardens. They constitute a remarkably fine range of galleries, as may be imagined. The industrial specimens will occupy the ground-floor. One feature whereby the forthcoming Exhibition will be distinguished from its predecessors will be its arrangement of the objects according to classes, and not according to nationalities. No prizes will be awarded, but certificates will be issued showing that the parties receiving them had the distinction of displaying their products in this Exhibition. The first division of the Exhibition is devoted to the fine arts, including articles of utility possessing an artistic character. There are seven classes in this division. What is termed the second division of the Exhibition will consist of manufactures, including also machinery and raw materials.

Paris, it is understood, will be well represented, notwithstanding recent disastrous events. Brussels wants much more space than can be given. Bavaria has intimated that the whole of the space allotted to her will be taken up by a display of fine art. The Dusseldorf Academy have given permission for the exhibition of their pictures and sculptures; and the Royal Porcelain Factory of Berlin will send a collection of porcelain for exhibition. It is to be hoped that our own artists and manufacturers have fully availed themselves of the opportunity afforded.†

Some parts of the Albert Hall will be utilised for purposes of the Exhibition, and the great hall itself will doubtless be the scene of any regal ceremony that may take place in connexion with it. The scaffolding within the Hall is fast disappearing, and the work of completion is rapidly progressing.

The roof is remarkable. It is composed of wrought-iron ribs of various spans, springing from cast-iron shoes, and meeting at the centre a wrought-iron curb, about 18 ft. deep, the underside of which is 33 ft. above the springing line. The inequality of the spans is due to the form of the building, the plan of that portion of the building which the roof covers being an approximate ellipse, the axes being 219 ft. 4 in., and 185 ft. 4 in. The wall at the springing line is only 3 ft. 2 in. in thickness; and to provide for the thrust induced by the extraneous weight of snow and force of wind, and the weight of the roof covering and ceiling over and above that of the principals and purlins, a continuous wrought iron curb or tie is built on the top of the wall. This curb is about 4 ft. wide, and in section is somewhat similar to an ordinary built plate girder laid on its side, the web being 7-16ths in. thick; the flanges 8 in. by 7-16ths in., and the four connecting L irons, each 3 in. by 3 in. by 3-8ths in.

Upon this curb rest cast-iron shoes fitted with adjustment wedges at the back, by which means the principals have exact proportion of strains laid upon them. The principals, thirty in number, spring from these shoes, and are calculated to carry, acting as trusses, their own weight, and that of the structural portion of the ceiling and covering; any weight beyond this being transmitted through the upper members of the principals, as in an arch, to the horizontal curb. The principals are curved trusses, with half-round feet of 10 in. radius, and increasing to a depth of 17 ft. 6 in., where they meet the centre curb. The upper and lower member is of a T section, 9 in. deep and 11 in. wide; the plates, 5-16ths in. thick; and the L irons, 3 in. by 3 in. by 5-16ths in. The bracing consists of diagonal rods, fitted with adjusting screws, and verticals composed of four L irons, 2½ in. by 2½ in. by 5-16ths in., cast-iron distance pieces being inserted about 2 ft. 6 in. apart, and kept in place by bolts. The centre curb is a strongly-built structure of plate and angle iron, and is on plan concentric with the outer walls, the diameter being 16 ft. by 13 ft. 7 in. at the top, and 14 ft. 2 in. by 11 ft. 7 in. at the bottom. The purlins are composed of braced angle iron flanges, with Channel iron struts. On the upper curb is built a ventilating chamber, with movable windows to regulate the draught. Below this chamber the covering is composed of glazing on rolled iron sash-bars of strong section, the lower portion of the roof being boarded and slated for a height of about 12 ft. above the springing.

The ironwork comes from the shops of the Fairbairn Engineering Company, and was erected by the contractors, Messrs. Lucas, under the superintendence of Lieut.-Col. Scott, R.E., the architect of the building; Mr. J. W. Grover, C.E., being also consulted on the constructive part. We mentioned some time ago that when the centres on which the roof was built were struck, the deflection of the centre curb was only 5-16ths of an inch.

For the sake of comparison we add a short list of roofs of remarkable span:—

Cannon-street Station	190 ft.
Charing-cross Station	166 ft.
New Lime-street Station, Liverpool	220 ft.
Victoria Station, Great Western Railway	120 ft.
New-street Station, Birmingham	212 ft.
St. Pancras Station	240 ft.
Royal Albert Hall	219 ft. 4 in. by 185 ft. 4 in.

This roof, therefore, is within 21 ft. of the span of the St. Pancras Station roof, springing, however, not from the ground, as that roof does, but from the top of a wall over 100 ft. high.

Hydraulic lifts will be employed for the purpose of conveying visitors to the upper galleries of the Hall. It is in these galleries that the exhibition of educational works and appliances will take place, and visitors to the Exhibition be afforded an opportunity of hearing the organ and other musical performances without extra charge.

A report has just now been issued by the Society of Arts, in connexion with the desire entertained by the council to establish a National Training School for Music, which has reference to the use of the Albert Hall. The report recommends that, in promotion of this purpose, a musical section of the society be instituted, with a separate fund, in order to give concerts annually in the Royal Albert Hall. These are to consist of performances of vocal and instrumental music of the highest character, and after paying the expenses of the concerts, the profits are to be applied to the establishment of a National Training School for Music.

Members of the Society, for every subscription of one guinea paid to the musical fund, are to have the privilege of obtaining a transferable ticket for six evening concerts in the arena and balcony without further payment, provided that no member as such shall have the privilege of receiving more than five tickets on those terms; and persons not members of the Society are to have liberty to purchase tickets on such terms as the Council may from time to time determine. A committee has been authorised to make the arrangements for the six concerts as soon as a guarantee fund to the extent of 2,000*l.* and one thousand subscriptions of a guinea have been obtained.

Our readers will notice in the exterior view we give the position of the mosaic frieze of which we have before now spoken. It consists, we may remind them, of a series of cartoons, each of which averages 4 ft. in length and is 6 ft. 6 in. high, the whole length being 794 ft. The number of cartoons is sixteen, and the subjects of them are the various matters connected with the arts, sciences, and industries. Messrs. Armstead, Armitage, A.R.A., Horsley, R.A., Marks, Pickersgill, R.A., Poynter, A.R.A., and Yeames, A.R.A., are the artists, and the subjects are agriculture, astronomy, geodosie, workers in wood, and stone, and iron, music, poetry, construction, sculpture, applied mechanics, and so forth. For the most part they are highly satisfactory. These cartoons are in terra-cotta mosaic, of simple outline and colours, the figure outlines being in black, the figures in buff on a chocolate ground and have been executed by female students at the South Kensington Museum for Messrs. Minton, Hollins, & Co.

Much remains yet to be done to complete the building. So vast is the grove of timber within,—the massive central stack reared for supporting the key-ring of the roof, and the circular group of scaffolding proper that lines the great shell,—that it requires all our confidence in the calm assurances given by Lieut.-Col Scott and Mr. Thomas Lucas to anticipate the opening of the Hall by the 1st of May. On the whole, we think that the present condition of the building is rather less favourable to its acoustic success than will be that of its complete finish. Whatever break is given to the waves of sound by the irregularities of the scaffolding will be equalled by that caused by the persons of the audience. Again, the completion of the ceiling, as to which we shall have a word to say, will certainly not lessen the effect of sound

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* See p. 986.

† The days named for the reception of the different classes of objects are as follow:—Machinery, February 1, 2, 3, and 4; scientific inventions, Feb. 6 and 7; educational works and appliances, Feb. 8 and 9; pottery and raw materials, Feb. 10 and 11; woollen and worsted fabrics and raw materials, Feb. 13 and 14; sculpture not applied to works of utility, Feb. 15 and 16; paintings applied to works of utility, Feb. 17; sculpture applied to works of utility, Feb. 18 and 20; engraving, lithography, photography, &c., Feb. 21; architectural designs, drawings, and models, Feb. 22; tapestries, carpets, embroideries, &c., Feb. 23; designs for all kinds of decorative manufactures, Feb. 24; copies of pictures, mosaics, enamels, &c., Feb. 25; paintings not applied to works of utility, Feb. 27 and 28.

within. The peculiarly hard character of the cement and scagliola used, the careful grooving, tonguing, and binding together into a veritable drum of a segmental portion of the ceiling,—all these are elements of acoustic success. But the main point, after all, we take to be the shape and proportions of the building.

Her Majesty the Queen, whose lively interest in the progress of the building is well known, paid it a visit on Saturday last, accompanied by the Princess Beatrice, coming up from Windsor Castle for the purpose. The Queen inspected the frieze, and then proceeded over a rough but commodious gangway to a platform in the centre of the building, visiting the Royal box, and other portions of the edifice. A little boy named Frederick Britten, a son of one of the workmen employed on the work, sang, without accompaniment, as did also Miss Anna Williams; and one of the officials of the Science and Art Department played several airs on the violin. The Queen expressed her great satisfaction, and encored Miss Williams. After her Majesty's departure, the experiments were continued, and the means were thus given of comparing the effects of similar sounds, as heard in the arena (or pit), the boxes, and the galleries.

We are bound to bear testimony as to the excellence of the result. Not only were the faintest tones distinctly audible throughout the whole great building, but they were almost equally audible throughout. It seemed that on the minor, or transverse, axis of the ellipse they were somewhat fainter than elsewhere; but the difference, if real, was not great. When the violin was played it was impossible to get away from the sound,—close to the player, at the bottom of the arena, in the boxes, in the gallery,—you seemed equally near to the instrument. The wailing notes of the catgut filled the entire area, and fell on the ear without interruption or echo. The effect of Miss Williams's voice was perfectly charming. The musical sounds passed you even as you stepped into the outer corridor, quite out of the reach of the proposed audience, and seemed, in that position, to soar and float through the air like the notes of the skylark.

For speaking, there seems reason to hope that the amphitheatre will be no less suitable. We were not furnished, it is true, on Saturday, with an orator as well as with a musician and with vocalists; but the brief remarks which we could extract from the modesty of those on the orchestral platform were fully audible. It is probable that great deliberation of utterance will be the main requisite in a speaker in this place, and that, with this, he would be able to fill the Hall. This, however, yet remains to be proved.

Of the organ constructing by Mr. Willis we may find another occasion to speak. It is to be, they say, the finest organ in England. In the quality of sweetness of sound, which, to some ears, is the first of musical charms, all new organs are deficient. That at Birmingham has remarkably improved in this respect since its opening, when it was signally brassy. The large new organ at St. Paul's is a harsh and disagreeable instrument compared with the magnificent old organ by Father Smith, now removed to the choir, on which, the other evening, we heard produced such wailing and sighing of the winds, such rolling response of thunder, and such a jubilant outburst of the *vox humana* or *vox cælestes*, in which the whole forty-four of Grinling Gibbons's lovely cherubs seemed to join with open mouths, that it was worth passing a vigil in the church to hear it,—a vigil of a winter's night.

The point on which we feel, at this moment, the most anxiety is, what may be called with propriety the glass ceiling. We speak on this subject with the less reserve because we are aware that it is yet under discussion. The original plan of lighting the building by elliptical openings in the roof, has been abandoned for that, suggested by us, of glazing the roof. It is very possible to over-light a building, and the effect is very painful to the eye. Our experience of buildings thus rendered all but intolerable is, however, confined pretty closely to those of which the walls are pierced by large and numerous windows, while the roof casts a shade. The positively painful effect which white light, thus treated, produces on the eye, was no doubt one main reason which led to the excellence of the art of the glass-stainer in the thirteenth and fourteenth centuries. Our knowledge of good roof lighting is more restricted. It cannot be said to be more satisfactory. In one of the best known instances, that of the elegant and commodious reading-room of the British Museum, the light has a perplexing, irritating character, which cannot be altogether due to the atmosphere of Bloomsbury. We believe that the defect is due to its admission through the vertical sides of the lantern. Of course if every ray of light that thus enters be traced, it will be seen at how many angles it must be reflected before it falls fair on the table of the reader.

Now, the external windows of the Albert Hall serve to light the corridors, and rooms, and passages, and throw but little light into the main area of the building. This, we are convinced, is a great advantage. If, then, the ceiling itself be rendered, not glaring, like a window, but luminous, like the atmosphere, we shall have such an irradiation of the whole interior as will correspond with that of an hypæthral temple or theatre. This effect cannot be attained by the use of transparent glass, which would localise the source of light, and entirely defeat the object we have in view. It would not be attained by white, the exclusive introduction of roughened or ground glass; as the white element would still predominate, while the aërial light is blue. It would probably be best attained by the use, or, at least, the free intermixture, of a pale blue glass, or even of the pale rich blue of the early glass-workers, interspersed with ruby and yellow. For this, however, there is neither time nor, we suppose, money. What remains is a treatment *en grisaille*. Many of the windows of York Minster are filled with such glass as we suggest. Not only must the luminiferous quality of the glass be attended to, but it is of the utmost importance to the architectural success of the interior of the building that the harmony of the ceiling should be maintained. It must be a true composition, stamped by unity of design and due subordination of treatment. The glazier must not intrude on us, nor the carpenter, nor the iron-fitter. Anything approaching the endless and unrelieved parallelograms of the Crystal Palace will entirely ruin the building. Any emphasising of the lines of rib must be avoided; for, let us remember, it is not a case like that of mullions and transomes, or of the perforations in solid stone in which all our pointed windows originated. Stonework, rich in its own architectural beauty, may make glass subservient to its own requirements. Ironwork has no architectural beauty. Its merits are intellectual, not æsthetic; structural, not decorative. If, then, we make the details of our glass wait upon those of our ironwork, we shall have something poor and inartistic—a station roof or a factory skylight—not a great crystal velarium.

The ceiling, let us suggest, might be in three concentric zones, respectively occupying one-half, one-third, and one-sixth of the diameter. The lower zone should be a bold black diapered or foliated pattern, on a grey ground, the ornamentation to be of the grand severe style of the older glass foliage, of which we have good English examples. The central zone should be for the most part of grey or roughened glass, but still with black diapers or inlet lozenges and lines. The third part should be a repetition of the outer zone, with the exception that the thickness of all the black stencilling, the size and proportions of the foliage or diaper, should bear the same ratio to those of the lower part that is borne by the respective circumferences of the outer and inner circles. Thus treated, we should probably have a ceiling as original and as successful as any other part of the building.

We wish a speedy and successful completion to the Hall, and an inauguration of acoustic experiments (which stands *Kensingtonice* for very charming concerts) in a theatre which is certainly unique.

THE AUTOBIOGRAPHY OF AN OCTOGENARIAN ARCHITECT.*

WHEN an author tells us he helped to lay out Bryanston and Montague squares, now as brown, begrimed, and composed as if a century had elapsed since the last labourer carried away the last ladder used in their erection; that, as ensign, he carried the colours of the corps of the Loyal British Artificers, when that body lined the road from Whitehall to St. Paul's, at the funeral of Lord Nelson; that he was the means of inducing King William IV. to confer the designation of Trafalgar-square upon the *Place* now known by that name; moreover, that he has studied architecture for sixty-five years, in the course of which period he has been in communication with many eminent men,—we may take it for granted that his talk will be worth hearing. Accordingly, we prepare to listen with attention.

A chocolate-colour covered quarto lies open before us, containing a portion of an outline of the professional career of this octogenarian architect,—a fine old English architect, we may add, of the good old school that considered the grand tour, with its summer loiter in Greece, as an indispensable link between the conclusion of his articles and the commencement of practice on his own account; who, besides having influenced London topography to the extent indicated above, has given some of its buildings finer touches that he delineates with triumph. The Admiralty, those head-quarters of the hopes of so many of the cadets of old English families, especially is indebted to his zeal; for it was he who subtracted the two missing columns in the façade to form side entrances into the courtyard. He is associated, too, with another of the lesser lions Londoners always point out to their country cousins, for it was under his superintendence that the first ball was put up at the Royal Observatory, Greenwich, to denote the correct time to the shipping in the river. Our octogenarian, in a word, is Mr. George Ledwell Taylor, formerly civil architect to the Naval Department.

His autobiography is more curious and entertaining than, strictly speaking, useful. The hundred illustrations with which he enriches the first volume of it, now issued, are nearly all too late in the day. The subjects selected have been done over and over again in the long interval that has elapsed since the tours were taken in which they were measured and sketched. They are all interesting, but many are too familiar. Not so, however, when Mr. Taylor and his friend Cresy trudged four thousand miles and more on foot, gallant, sure, and hopeful; through England first, and then by sea, and conveyances occasionally, till more than seven thousand miles had been accomplished, through France, Switzerland, Italy, Greece, and Sicily. In those days John Britton was only commencing the series of pioneer works that have proved so useful to the architectural student, incomplete though they be as far as details are concerned; the issue of Smirke's Specimens of Continental Architecture was discontinued; Cockerell's Greek drawings, made only a short time before, were lying unpublished in his portfolio; Pugin was unknown to fame; the Brandons were not; the comprehensive Fergusson was not; the more familiar and friendly Murray was not. Everything was comparatively new, and generally unpublished. And Mr. Taylor measured and sketched York Minster, and St. Peter's, Rome, with the same enthusiasm as when, with Signor Lusieri as his guide, he climbed to the roofs of Greek temples to master their construction. Beverley or Bassæ, Stamford, Strasbourg, or the Temple of Jupiter Olympius at Agrigentum, it did not matter which; he measured and drew everything that came in his way, with a tolerable degree of certainty that it had not been done before. In the half-century that has elapsed, however, nearly every building he illustrates has become almost a household word with us. Who does not know every stage in the Leaning Tower of Pisa, or every interstice of the Gate of Lions at Mycænæ, or every detail of Fountains Abbey, for instance? Yet here we have them once more. There is, however, a second volume in the press, which may contain novelties in the way of sketches. The present instalment shows us about forty-five years of professional experience acquired under circumstances that, upon the whole, appear to have been singularly fortunate.

Mr. Taylor was articled to Mr. Parkinson, of Ely-place, in 1804. It was under him that he assisted in laying out the Portman estate; but the Earl of Shrewsbury appears to have employed our author personally in the alteration of the large house at the south-west angle of Bryanston-square. This is the only commission recorded before he set out with Mr. Cresy, an old schoolfellow and fellow-pupil, on the first of his walking tours. On this occasion they visited the south of England. On the next, they met in York; and thence studied and sketched, after the Minster and Lord Burlington's Assembly

* The Autobiography of an Octogenarian Architect: being a Record of his Studies at Home and Abroad during Sixty-five years. By George Ledwell Taylor. London: Longmans & Co., Paternoster-row. Margate: T. H. Keble. 1870.

Rooms, Beverley Minster, Fountains Abbey, Rivaulx, Duncombe Park, Louth, Boston, Grantham, &c. Peterborough, Lincoln, and Ely Cathedrals were also measured and sketched in this tour; the roof of King's College Chapel especially examined, and the construction of it mastered.

Looking back at his investigations of these days, Mr. Taylor has a word or two to say about Lincoln Cathedral. The old part of the west front of this edifice is ordinarily ascribed to Remegius; but he finds reason to believe that the lower portion of the façade, up to the interlaced arches over the great openings, is a part of the first building erected by Paulinus, according to Bede, in 628. His ideas on this subject are fully explained by means of diagrams.

In the following year, 1817, the friends started on the Grand Tour. There were the long broiling drive to Brighton, the slow voyage to Dieppe, including a night at sea, and the rumbling ride in the *diligence* to Paris, that are now all things of the past,—before, however, the real journey began, for Cresy was already in Paris. After a week in that passionate city, they set out for Chartres, and commenced their sketching operations. They measured and drew the cathedral; and the plans of Chartres, Amiens, Rouen, St. Onen (Rouen), Evreux, Beauvais, and Rheims Cathedrals all appear in the volume before us, drawn to the scale of 100 ft. to an inch. It is not clear, however, that they measured them all, though they visited and examined them. They met with one fact in the neighbourhood of Beauvais, that impressed the author to such an extent that he has related it twice, with the distinction only that he calls the scene of it Villiers in one place and Villers in the other. An eleventh-century church was in the course of demolition at Villiers, and the component parts of it were being sold, the capitals being offered to them at five francs apiece. It is now too late to tell this tale twice with any effect, but the persistency might have been useful at the time.

The friends made a tour of pleasure of 250 miles on foot, through Switzerland, and then came down by Geneva and Lyons to Marseilles. Thence they performed the feat of walking the distance to Frejus, fifty-seven miles, before dinner. Mr. Taylor shall give his own curt version of this "good joke":—

> At Marseilles we joined our friend, Mr. Sanders, and his artist, Mr. Purser. As we had walked through Switzerland and from Lyons, Mr. Sanders, on our retiring to rest, observed jestingly, "Gentlemen, as you are so fond of walking, perhaps you would prefer doing so to-morrow to Frejus; it is only fifty-seven miles, and whoever gets there first shall order the dinner and accommodation; we will carry your luggage," which was *peu de choses*. "Agreed," said we; "good night."
>
> At three o'clock we got up, consigned our knapsacks to Andrew, Mr. Sanders's German servant, and started. The first eighteen miles up the Esterelle, a very steep road, to breakfast. Mr. Sanders was called about eight, and Andrew prepared to dress his master's hair, &c. "Well, Andrew, are the gentlemen going to walk to-day?" "Oh yes, Sar, tre clock!" "What!" "Yes, tre clock, Sar!" "Order horses—four—directly. I will not have my hair dressed, nor wait for breakfast." However, he never caught us up. The first eighteen miles his four horses could only go a foot pace, and we arrived at Frejus soon after six. At seven they came, and found dinner all ready, for which, and lodging, he had to pay.

Mr. Sanders, we may explain, was a retired architect, and was Soane's first pupil. He joined Mr. Taylor in his tour through Greece in the following year. At Pisa the two travellers drew the cathedral, baptistery, and leaning tower; and, subsequently, they published their drawings. At Rome, too, they amassed materials for a work which they ultimately published under the title of "The Architectural Antiquities of Rome." Consequently, when we complain of the selection of sketches as representing familiar buildings, we must recollect that the author has performed a share in making them so. In Rome they found and associated with Hardwick, Donaldson, Valliamy, Basevi, Goldicutt, architects; Gibson, sculptor; Eastlake, Denning, and Harlow, painters; and they made the acquaintance of Canova, through a letter of introduction with which Westmacott had furnished Mr. Taylor. Barry started on his Grand Tour only five days after our author, and for three years they were frequently at the same places within a day or two of each other, without, however, often coming in contact. Cockerell had been over the same ground about five years before, and was well remembered by many persons with whom the friends met. This last architect, indeed, left a trail of regard behind him which Mr. Taylor describes as "devotion." Six of these young men, we may add here, on their return to England, were members of the Architects' Club, and met at the monthly dinner at the Thatched House, where they must have enjoyed many reminiscences in common. These were Barry, Cockerell, Basevi, Hardwick, Donaldson, and Taylor.

In Greece, Mr. Taylor was so fortunate as to discover one of the most interesting of the minor monuments of antiquity. His party, which now consisted of four persons,—for Mr. Sanders and his artist had joined them, as indicated above,—made an excursion to Chæronea from Livadia. Here, with their minds full of realisations of the great engagements that have made the plain famous through more than two thousand years of history,—of the Bœotians, Thebans, Athenians, and Philip of Macedon,—they were recalled to the present by the stumble of Mr. Taylor's horse over a block of slippery white marble which cropped up in the road. He looked back at the cause of the jolt, and saw an indication of sculpture on the marble, which induced him to call a halt, and make an exploration. Some peasants working close by were brought to the assistance of the party, and by their united efforts they succeeded in disinterring the colossal head of a lion, weighing about three tons; none other, in fine, than that described by Pausanias as having been erected to ornament the tomb of the Sacred Band of the 300 Thebans, who, till they fell before Philip, had never been conquered. Further research yielded more fragments, including one of the hind legs, which was 2 ft. 3 in. in diameter. The satisfaction of this discovery was great; for as Strabo mentioned the fact of the tomb having been erected, and Pausanias more minutely described it, successive travellers had sought for it with curiosity, without, however, succeeding in finding it. Gell, Dodwell, Leake, Hammond, and Holland,—all mention this lion and their unavailing search for it. On the return of the party to Athens, they apprised the English consul and other persons of influence of the discovery; and when Mr. Taylor became Civil Architect to the Navy he endeavoured to persuade the Admiralty Board to allow it to be brought home in one of their vessels. But the lion is still in the land where the generous victors placed it. M. Siegel has published a restoration of it in the "Transactions of the Soc. Archeol. di Roma," 1856, a facsimile of which is given by Mr. Taylor; and there is now a cast of it in the British Museum. As Sir Thomas Wyse points out, the attitude is expressive of angry defiance, inasmuch as the heroes it commemorated were defeated. In Siegel's restoration it is seated on its haunches, with its mouth slightly opened as though giving utterance to an angry growl. As Mr. Taylor's claim to the discovery was lost sight of, he, as late as 1862, on the receipt of the cast at the British Museum from Athens, made it known to the authorities, in a correspondence printed in full.

Brigands and quarantine were the chief discomforts to be dreaded in Greece. There were neither at Marathon, though two days before they visited that place they were stopped in an excursion to Anchesmus, because other persons were performing quarantine there. Mr. Taylor has but little enthusiasm for Marathon:—

> "Sunday, June 21st. Set out at six o'clock for Marathon, intending to go by Vraôna; but after two hours' travelling we came to a full stop in the midst of untraversed mountains, and found our guides had lost their way. An hour or two were lost in endeavouring to find a track; but, after all, we were obliged to return to another convent we had passed, and there were put in the road; but we came into the plain by a village at the south end of it, and not by Vraôna, as we intended. We traversed the plain to that place, and were persuaded to proceed to Marathon, where we dined and slept. It is a miserable village between two hills, lying out of the plain, next the sea."

It was generally difficult to procure horses, and many delays had to be endured on that account. But the travellers pushed on and on from Athens to the island of Egina, Corinth, Xanthe, and thence to Malta, Sicily, Naples, and back again to Rome, where in the course of the winter they finished their drawings and measurements for their Roman work. On the way home to England their sympathies, of course, were entirely with classic art. Every temple, triumphal arch, and antique fragment on their return journey had a charm for them which their Greek experiences, doubtless, intensified. Only one Gothic building on the route is illustrated, which is that of the church of San Francesco. There are two highly finished drawings of this building, showing the two churches, one over the other; although, we observe, there was only part of a day spent there. These are probably the result of some subsequent visit.

Mr. Taylor prepares a sheet, placing the plans of the classic temples in juxta position with those of the cathedrals, which is given in this portion of his work. A second sheet shows us the relative west elevations, to the same scale, of the Temple of Minerva at Athens, and of York Minster. On this subject the author remarks, that the construction and finish of the marble temples is certainly most beautiful, but the magnitude and accommodation for worshippers in the cathedrals surpass them. He leaves his readers, he says, "to indulge in any reflections that may occur to them on the comparison." But adds, that his is a "plain unvarnished tale," which he hopes will be useful. In the face of the illustrations, since published by Cockerell, Donaldson, Gandy, and others, his sketches may be considered rough, but he trusts, modestly, they will be accepted "for what they are worth."

After this Mr. Taylor's experiences are English. He and his friend settled down in London as the first tenants of Mr. Peto's New Furnival's Inn. They occupied themselves with the arrangement and publication of their work on Rome, in the course of which, as a variety to the usual smoothness of their road, they met with obstructions that were the results of two fires, and a bankruptcy on the part of their printers and publishers. Five hundred copies of the work, the price of which was 18 guineas and 24 guineas, on India paper, were burnt in Mr. Moyes's premises. Their first new undertaking was to assist Britton with his work on Canterbury Cathedral. They offered to make all the necessary drawings, *con amore*, and he closed with them.

More than once in the course of his life the author approached the consummation of desirable events, and then drifted away again before he drew sufficiently close to the opportunity to grasp it. Thus, when friendly with Wilkie, there was a proposition to make him a Royal Academician, which was not carried into effect; and at another time, there was a prospect of associating himself with Sir Charles Barry, which also fell to the ground. On the other hand, he appears to have obtained the lucrative post of Surveyor of Buildings to the Admiralty, with the least possible exertion. The appointment being vacant, he resolved to apply for it, when he was advised by Mr. Lushington, then Secretary to the Treasury, to get three certificates from members of his own profession, and three from bankers or merchants, and send them to Lord Melville with his application. He obtained the requisite testimonials from Messrs. Soane, Nash, and Smirke, architects, and Sir John Lubbock (banker), Sir Thomas Reid (merchant), Sir John Rae Reid (merchant), his father's solicitor, his master, Mr. Parkinson, and Mr. Burton; sent them in; and in the course of a few days received the appointment. He retained this post for thirteen years. In 1827, the Duke of Clarence, afterwards King William IV., became Lord High Admiral, and, consequently, the head of Mr. Taylor's department. His subordinate records that he never met a kinder man, and gives several instances of his nice consideration for others. Among other details he relates the circumstances attending the extraction of the pillars from the façade of the Admiralty.

One day the Duke told him he was going to have a large party at his official residence, and that the fact of there being but one entrance to it was very inconvenient. "I wish you to consult with George" (Colonel Fitzclarence), he added; "he is a good architect, and between you, I dare say, you will hit upon some remedy for this on a future occasion." Mr. Taylor declared he had a remedy ready contrived, which he could explain and carry into execution in time for the party next day, if the Duke would give him leave. He had thought over the matter, and was prepared with a model showing the alteration.

> "I soon fetched the model, which consisted in removing one column from the façade on each side of the entrance, and sustaining the entablature by an architrave of cast iron similar to that to be removed. The Duke said, 'Excellent, let it be done forthwith. You say it can be done in time, which seems almost impossible.' 'I am quite sure of it,' said I. Mr. Croker had some time previously sent for me and said, 'I have sent for you, Mr. Taylor, to tell you I am the organ of the Board, and any directions you may receive for alterations from his Royal Highness, you will refer to me.' I therefore went at once and informed Mr. Croker of this. 'Very well, leave it with me.'"

The surveyor had no idea of thus abandoning his pet scheme, and urged that he must give orders for its execution immediately, in order to ensure its completion in time. But Mr. Croker

was inexorable. In this dilemma the author, who seems never to have been at a loss for a first-class adviser, consulted Sir George Cockburn. "He paced the room as if in a soliloquy, saying, *sotto voce*, '*Take care of yourself, and never mind Croker.*' 'My dear friend, it is an awkward position you are in, I cannot advise you.' Whereupon I made drawings, and took them to Maudsley, who undertook to perform the work on receiving my order to do so." In the afternoon he observed Mr. Croker and Mr. Smirke in consultation over the case, across the street. He went to them and urged his point, but still did not succeed in carrying it. However, the next day he received a letter from the Duke, which enabled him to set to work. A *facsimile* of the letter is inserted.

In 1830, when on his way to Stangate to give directions concerning the repair of the docks at Deptford, Mr. Taylor observed the late Sir Charles Barry and a stranger, in a gateway, examining what he took to be a block of Portland stone carved into a Corinthian cornice. "What a fine block of stone you have there," he exclaimed. They laughed, and Barry replied, "Let me introduce to you Mr. Ranger: this block of stone, as you think it, is composed of his patent concrete, and is going up as a cornice in a house now building in Pall-mall." This led to an appointment with Mr. Ranger to consider the applicability of concrete to the works in the docks, and its ultimate use there, as well as at Chatham, in 1834. The large storehouse at Chatham, 540 ft. long, was cracking, and coming to pieces. It was imperative that it should be attended to, and it was successfully underpinned and furnished with a solid foundation of concrete, without the removal of the enormous quantities of stores it contained. An account of the process employed was communicated by the author to the members of the Royal Institute of British Architects about two years afterwards, which is reprinted in the volume before us. Mr. Taylor designed the Proprietary School at Lee, and erected it in concrete. It was a reduced copy of the Propyleum at Athens, "with central portico and side ones, with Doric columns, full entablature over, tryglyphs, &c.," all in concrete. The new Admiral's House at Sheerness was built upon a foundation of concrete. But, once the new material failed: because, we would add in parenthesis, not rightly managed. This was at Woolwich, where a graving dock had been built of it, with a facing of granite. When finished, and adventurously deepened by the reconstruction of the bottom, 4 ft. deeper, he perceived to his horror that the floor of it heaved "like the heaving of a human breast." He reported the failure to the Board with deep sorrow, and a consultation was agreed upon. Mr. Walker was called in, who prescribed granite for a first-class dock, but he ultimately took fright at the subterranean springs that had proved the masters of the concrete, the dock was abandoned, and a large basin only formed.

On one occasion, Mr. Taylor was required by the Board to inquire into the nature of some damage that had been done to the Plymouth Breakwater in a great storm. He relates, with great simplicity, his assumption of familiarity with the diving-bell. When the descent was accomplished, he found huge masses of limestone rolled up from the toe of the work on to the top, one of which was of eight tons weight, as well as breaches in the general line. When at the depth of twenty-five fathoms, surveying, he observed that blood was oozing from the nose, eyes, and ears of the clerk of the works who accompanied him.

The Melville Hospital, Chatham, was built from the designs of Mr. Taylor, with the wards in separate pavilions. He quotes from the report of the Commission for the organisation of military hospitals, the favourable opinions that have been passed upon it, and plumes himself upon the fact that the new St. Thomas's Hospital is precisely similar in plan to his design. He was desired, by the Lord High Admiral, to make plans for a larger building at Sheerness, for 1,000 men; but this was not carried out.

Mr. Taylor built the east side of the new square at Charing-cross, which, after King William's accession, with his permission was to be called King William IV.'s Square. But the name was considered unadvisable, perhaps unwieldy, by "the Woods and Forests" among other authorities. Our author repaired to St. James's, intent upon suggesting to the King the desirability of giving it the name of the victory in which Nelson fell. Here he found Sir Thomas Hardy waiting, among other officers, for an audience, and as the great hero died in his arms he considered him a more fitting person than himself to make the suggestion. He therefore intrusted him with the secret of his mission, but Sir Thomas would not take upon himself the ungracious task. However, Mr. Taylor waited his turn, saw the King, made his proposal of the alteration of title, and succeeded in his object. "I see," said his Majesty; "give me your plan, —pen and ink," and writing "Trafalgar-square, William Rex," handed it back to him: "There, take that to Lord Duncannon."

At last the day came when there was a change of luck. Lord Dalmeny and Lord Minto, both new members of the Board, considered it would be a saving to pension off the surveyor and appoint an officer of Engineers in his place; which officer, Mr. Taylor found, was to be Captain Brandreth, then about to marry Lord Dalmeny's niece. As misfortunes never come singly in ordinary people's experience, so they came in couples in that of our octogenarian. No sooner was he deprived of his post than scarlet fever visited his large family, and his wife, with two children, died of it. He thought first of qualifying himself for the appointment of district surveyor, and when a vacancy occurred in Westminster he commenced a contest, which he declined on learning that another competitor, the late Mr. Howell, had performed the duties for years before the death of the late surveyor. The autographs of most of the leading architects of the day, collected as referees to his ability, are photo-lithographed by Messrs. Whiteman & Bass, and form an interesting page. Ultimately Mr. Taylor embarked in building in Tyburnia and Westburnia. He built, he tells us, the west end of Hyde Park-square, Chester-place, and the south side of Gloucester-square. Then he built a house in Westbourne-terrace, and lived in it. He also built Orsett House, adjoining the last, both of which were kept low to give a view of Mr. Cundy's church. He then took five acres of the Bishop of London's estate. But bad times came; and the great fortune that appeared to be coming within his grasp gradually vanished.

But the formation of the South-Western Railway, the Regent's Canal Railway, and the North Kent Railway brought him fresh employment, the nature of which is detailed. The proposal to continue the latter from Stroud to Dover brought him into communication with the Duke of Wellington, of whose letters upon the subject he gives *fac similes*. But he met with but little support from him; especially, he refused to have his name appear as a patron. No one, the Duke declared, used railways less than he did; but on public grounds he would assist the construction of this one. The plans were completed and deposited in due time, and the Bill drawn by Dorringtons, with, unfortunately, the name of the Lord Warden of the Cinque Ports placed at the head of the list of commissioners. As soon as the insertion of his name was perceived by the Duke, he resolutely withdrew from all relation with the project. A violent opposition from the South-Eastern Railway Company ensued, which was so far successful as to end in the abandonment of the Bill for the time being. Mr. Taylor relates that he had to bear the expenses of this abortive scheme to the amount of 3,000*l.*, owing to his neglect to obtain the signatures of the directors to an agreement to recompense him. This is the line subsequently taken up and carried out as the London, Chatham, and Dover Railway.

If any one should ask why the octogenarian architect has given us all these particulars, they will find that he has prepared an answer to the question. He says most minds endeavour to do some good, or to leave some record in this life; that he feels these desires; that he hopes to show he was persevering and industrious; and to convey some information to the rising members of his profession that may be generally useful and instructive. And when we have looked through his account of his successes, failures, and mistakes, we feel that he may not have fallen altogether short of his aim.

Microscopic Photography put to Good Use.—Paris is said to contain 1,400 trained pigeons, so that there is a prospect of obtaining news by this means as long as the siege lasts. On the 17th ult. a pigeon arrived from Tours with a small sheet of paper, on which a Government despatch, and 116 private letters, were photographed in microscopic characters.

ON COLOUR IN CHURCHES.

The four letters addressed by Mr. Edmund Sharpe to the *Builder*, on this subject, since August last,* have been collected by him into a good-looking pamphlet,† and will, no doubt, be thus read again by many who saw them in their previous form. Their collection serves to indicate that the writer has "had his say," or, at least, a share of it, and gives a fair opportunity for a glance at the various views on this much-vexed question. The existence of parties in the matter is constantly forcing itself on the attention,—the Mono (or Oligo rather) and Poly schools, now in conflict almost internecine, now in temporary amicable compromise; the "*Droit*" and "*Gauche*," with all the formalities of hostility; and a "*Centre*" between the two, comprising the very large Cave of Adullam of chromaticians. Mr. Sharpe has devoted his well-known skill and fertility of illustration to these letters, and, with the art of an advocate, has put forward all the most prominent points of his side of the question, though, at the same time, we (who knew it already) do not fail to see indications enough that, on occasion, he could be an impartial, as he is an accomplished, judge. It is very satisfactory that the general bearings of any art practice should be often and thoroughly discussed from the first, and especially at the time when discussion may be of immediate value. A correspondent of the *Builder* (p. 649, *ante*), a little while since, said that "our theory of restoration has to be perfected, now that the greater portion of the work of restoration has been done." Perhaps this is not far from a specimen of most human doings. History sees so much more of the field than the makers of history.

Any consideration which we give it seems to lead us, in the desire for illustration, well away from our immediate subject into generalities,—"to follow any road far enough may lead us to the world's end."

The Cistercians, to whose discipline and customs Mr. Sharpe points with pleasure,—quoting, by the way, some of the instructions of their rule not closely touching the question of colour with an evident relish,—seem in so many respects under a different sky from ourselves that most of us find a difficulty in realising their austere and toilsome lives, and their rigid order. Mr. Sharpe "having visited the remains of all this order in France, England, and Germany" (a task no doubt undertaken in a holiday spirit, but without a holiday desultoriness, and that should surely be completed by the publication of a volume on the subject), must after such a quest have in his mind plenty of river valleys with his favourite buildings "devoid of all florid ornamentation" in the midst, wood-crowned hills in summer and autumn leafage, not to speak of the skies and purple sunsets; and we doubt whether the fiercely ascetic character of the men that erected their homes among these scenes comes up as more than an occasional recollection, when the images of the buildings and their surroundings "flash on the inward eye." The harmony of simple forms, regular repetitions and symmetries, with pastoral scenery, no one disputes; but how the luxuriance, and rich beauty and plenty, and the air of glad content, seem to contrast with the stern life that a St. Bernard of Clairvaux would have lived there, and made to reflect itself on the architecture of his house! Are there not two sets of tendencies in human nature, each with its own interest, the one necessarily excluding the other as far as it is dominant,—the enjoying (of course we only need to speak of good and pure enjoyments) and the self-denying impulses? The expression of the one being:—

> "Beautiful earth, and could we eliminate only
> This vile hungering impulse, this demon within us of craving,
> Life were beatitude, living a perfect divine satisfaction."

Contrasting with the other's:—

> "Humiliations and exaltations combining;
> Exaltations sublime, and yet diviner abasements,
> Aspirations from something most shameful here upon earth, and
> In our poor selves to something most perfect above in the heavens."

May it not be that these contradictions are part of a natural order? And may not the links by which these tendencies, themselves as at opposite poles, are connected, forming the multiform and many-sided human nature, be also thus regarded?

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* See pp. 621, 742, 781, and 820, *ante*.

† "Four Letters on Colour in Churches, on Walls, and in Windows." By Edmund Sharpe, M.A., F.R.I.B.A. Spon & Co. 1870.

In architecture, Mr. Sharpe and his school, with their love of pure form, "noble and stately proportions;" "gracefulness in the composition of carved work;" "foliage, arabesques, and diaper-work of the greatest elegance and of infinite variety, arranged chiefly in geometrical patterns;" feminine fairness and gracefulness;" and dislike of the "painful glare of common glass,"—are a remove or two from the original Cistercians, with their rigid exclusion of "*Superfluitates, et curiositates notabiles in . . . ædificiis*," &c., and the "*Vitreæ albæ fiant.*" And is this the happy mean? Or does a further progress in the same direction land us in "gaudy colour," "harlequinades," "tawdry finery," "meretricious decoration," "an art which is lower than that of sign-painting?" "Hardly so," the advocates of colour reply. "The healthy eye and mind ask for colour; the defect of excess only occurs when there is want of power, and skill of delicacy of hand, and eye, and mind; colour may be carried to any force, if properly regulated; vulgar colour is only unharmonised colour, or in the wrong place; though it may be true that "the finer the eye for colour the less it will require to gratify it intensely" (J. Ruskin, "Two Paths"); that *less* must not be under a certain quantity; and, again, Mr. E. L. Cutts (at p. 690, *ante*), "Every great school of architecture used decorative colour (and historical painting and sculpture besides), to heighten the effect of its great public buildings." Can there be a *right* or a *wrong* on this general question, which is simply one of preferences? In the colour controversy there are, however, certain not necessarily connected matters that strangely intermingle: it has been remarked that there is sometimes a strong tinge of what (for want of a better name) we may call ascetic feeling in many of those who are the lovers of strong colour, and some other matters reprehended by Mr. Sharpe; and that those influenced by the "characteristic sentiment of national sobriety in matters of taste as well as in matters of religious feeling" have often a very bright and genial outlook on the world and things in general. We think we may feel a hearty satisfaction that,—notwithstanding all the influences that are supposed to be grinding us down to an exact correspondence in every feature of our characters, rubbing off the angles to a shocking extent,—we find so many indications of that infinite variety, which, when co-existing with some important concords, gives the best hope of vitality and consequent progress in the future.

It seems pretty evident that buildings with claims to a considerable antiquity occupy a different position from that of the general mass of new or modern edifices. They have had ther finishing done by the hand of Time. Their charm consists, when we can get them fixed in the imagination, so much in the interest due to their history,—to the events that have taken place in them, or within sight of their walls,—to the men who have made them the scene of their energy or their devotedness, or their high humanity; blended in an undefinable war with the tender beauty given by the hands of Time and Nature in the sober harmonised tints, even in the gentle progress of decay. "They belong partly to those who built them, and partly to all the generations of mankind who are to follow us." Such charms as these, which can be only slowly attained, which mostly point to a very high order of excellence in the architecture, or its preservation would rarely have been secured ought, when we find them, to be considered as calling only for maintenance (upholding), and little more. The case is, however, rarer than we sometimes think. Many buildings once again stripped of the "conservative whitewash," with which (to quote Mr. Sharpe's eulogy on our grandfathers), "they considerately covered them up, and so preserved them for us,"—are, barring such tinges of half-destroyed colour as we find on them, restored to us as if time had gone over them, but had forgotten to impress them with his seal. Even then they seem so like fossilised history and art, so inclined to retire themselves from an intimate alliance with modern life, so full of a nature of their own, in fact, that only people of very strong character, very full of force with some work of undoubted value to bring forward, care to thrust themselves on the mind and eye, when the work of ages is the background. Perhaps, with reference to old buildings generally, no safer proposition could be made, nor one that would meet with a more general assent than this,—that in dealing with the heirlooms of nations, each generation should do its very best, as might surely be allowed, if, say, a Michelangelo filled with story the bare walls and vaults of St. Paul's,—or that it should be very little, and that little of the most careful and least obtrusive kind. Also that, in new buildings boldness and vigour are pleasant, and such buildings are clear from all the limitations—the sentimental reverences, let us say, that properly belong to works with an ærugo.

Space would fail us to consider in sequence the various questions Mr. Sharpe's letters would beguile us to speak about: we will, therefore, merely allude to the matter of "cost,"—to say that it is hardly in the question. The sums that are spent over "the purchase of so many square feet of deeply-coloured and almost opaque stained glass" may have only produced in some cases "gaudy pictures and grotesquely-dressed figures," poor and vulgar results; but the English nation is surely rich enough, and ought to be willing enough, to consider *only* the fitness and not at all the cost of whatever even the most exacting of dreamers (at all rational) would ask for public buildings, and this of set purpose and continually. Hawthorne, in his "Note Books," recently published, says:—"It takes down one's overweening opinion of the present time, to see how many kinds of beauty and magnificence have heretofore existed, and are now passed away and forgotten; and to find that we, who suppose that, in all matters of taste, our age is the very flower-season of the time, that we are poor and meagre as to many things in which they are rich. There is nothing *gorgeous* now. We live a very naked life." This sentence of the kindly and observant American, written in England, almost takes away any unpleasant taste that the word in italics may have contracted by being misused by Mr. Sharpe's "small tradesman."

SCULPTURE AND SCULPTORS IN THE BRITISH MUSEUM.

In spite of all the shortcomings of the present inartistic age, it is quite certain that at no time in the history of the world have there been so many chances of getting *artistically* educated as at the present moment. Daily does there seem to spring up some new society or organisation for the express purpose of putting before the student some fresh means of study and improvement. Books, in almost countless numbers, are at hand for consultation, and teachers more than ready, and cheap enough in all conscience, to devote all their time and energies to the work of instilling into the minds of others the means of doing that which society has denied them the opportunity of doing themselves, able as they may consider themselves, and are! But art-education, after all, if we bring it down to its lowest denomination, or raise it to its very highest, must depend mainly,—first, on the natural instinctive capabilities of the learner, and as much, perhaps, on the power, he may possess of looking at and getting instruction out of what has been done by those gifted few who have preceded him in the artistic race. It is in places like the British Museum Sculpture Galleries, for example, that the sculptor must find instruction and help in the work he has to do. All the lectures, however learned, will be to him as nothing as compared with what is to be got by sight and touch, and even measurement, of the great works to be found collected together in such a place. Hence the value of such a place and its contents, and the infinite importance of preserving it in such a state as that no part of its teaching power may be wasted or lost.

We are led to these reflections from the fact of the opening of a *new* room in the British Museum, or rather the enlargement of the old "Elgin Room," as it is called, by the addition of a square room at the north end of it, for the purpose with it of containing the whole series of marble slabs, and casts of the Greek frieze from the Parthenon, and from some regret at the way in which these famous works have been treated, and are now in course of treatment. There is, it is quite certain, no small difference between the old Greek way of doing things, and our own modern way of doing them. In Greece, ignorant and unscientific as it doubtless was, a Parthenon and no less, a great temple of solid marble, and marvellous proportions, was reared, may we not say so, to hold up these very marble slabs, and metopes, and pediment figures, at a cost, some say, of a million of money, and all the brains, and hands too, of a great architect of the works, and the help likewise of all his brains and hands of a great sculptor; nay, the greatest sculptor the world has ever seen. This was all done in *ignorant* and Pagan days, in days when nothing most surely existed which is now thought indispensable to human existence and happiness. But in contrast with this old way of doing things, what is it that is thought all-sufficient and good enough to house and hold up these very masterpieces of the brains and skill of hand of those ignorant and heathen workmen? Why, the long awkward "Greek room" has been simply lengthened, and that by the mere addition of a square compartment at the end of it, and divided from it by square pilasters, round which, as it would appear, the *angle* slabs of marble are to wind themselves. In short, this additional space thus fixed on to it, is for the make-shift purpose of holding all the slabs and casts in a single row.

Before we go further it may be as well to note that the great temple from which these fine works of the sculptor's art were taken was some 210 ft. long by 100 ft. wide, and that the Cella or inner walled temple itself, and round which the columns stood, and on which the frieze detailed, was about 170 ft. long by about 70 ft. wide; so that a room to hold these marbles, supposing the whole of them to be still in existence, must have been of those dimensions; the marbles, of course, being inside the walls of it, instead of as in the building itself outside of it. They were too far above the level of the eye, and in the morning and at noonday must have been well-nigh hidden under the shadow of the projecting architrave, and the columns which supported it. In the early morning and evening only could the sun touch these half-hidden sculptures. In the Museum room they are nearly on a level with the eye. Shakspeare evidently thought little or nothing of his great dramas; he wrote them, and left them for people to do what they liked with them. Phidias worked out this great sculptured frieze to fix it up almost out of sight, and simply as a mere *record* of a "procession," without probably for a moment thinking of it as anything more than that. But as far as it went it was perfect, and no one looking at it beneath the shadows which covered it failed to read and to see in it a true portraiture of a living and ever-recurring event; and, what is more than all to our present purpose, everybody could see in it how the said procession ordered itself, and how it was arranged; indeed, it was ever there to be read as a faithful record of a past act, and the guide, if need be, to a future one. It was the Athenians' stone-book of the great Panathenaic procession.

But with us, to whom the whole idea of the procession is dead, and with us who are *above* processions, all this intelligible stone talk is nothing, and of little or no interest; and the way in which these marble fragments are exhibited in the British Museum room too clearly proves it; for of arrangement proper there is actually none. Some arrangement, without doubt, there is; but it is not of the right kind, and is just where it ought not to be; for not only is all the original idea of the procession lost sight of, but a painful impression of its being all wrong is forced on the spectator by the ever-painful fact of the whole of the slabs, where it is possible to do it, being permanently fixed and *joined together* as though the separate slabs of the frieze were one long and perfect piece. All the joints between the separate slabs being filled in with stone-coloured cement, and even where there are blank spaces, and where there are slabs missing. Surely it would be much better not to fill in with cement or plaster the joints between those slabs which are manifestly *separated* by lost slabs, and where the subject is, of course, broken and incomplete. Indeed, is it not better, where so much is lost, to simply arrange the slabs side by side, and without any filling-in with new cement. They are *broken* fragments of a once perfect work. Mr. Westmacott has written to say that he has had nothing whatever to do with the arrangement: *who* has to do with it?

It must be recollected that when this room was originally constructed by the late Sir R. Smirke, there was no door either at the north or south ends of the room: the entrance-door was at the middle of one side of it, the east side coming from the Egyptian Room, and it was at this doorway that the slabs divided so that the door jambs represented the angles of the cella building, or the corners of it, as you went round it. In the building itself was represented the actual Procession, as it took place, for the Procession, after having collected itself in the space between the Propylæa and Parthenon, divided into

wo columns, which proceeded eastward along either side of the temple, and these having turned to the right and left respectively, reached the angles of the eastern front, and met opposite the eastern door. Here the bearer of the "Peplus," or sacred veil, and the two arrephori entered the temple, and delivered their sacred burdens to the Archon,—represented on the frieze by the way, and always described as a God!—and to the priestess of Minerva. All this is represented on the frieze itself, and one cannot help thinking what a much better plan it would have been, and more "educational," to have built a *new* room purposely for this magnificent work, of exactly the same dimensions as the *outer* wall line of the *cella* of the Parthenon, so that the slabs of marble from the frieze, and the fragments of it, and the plaster casts of those slabs now in foreign collections, might have been placed exactly in the position in which they originally stood in the Temple itself. The sole inconvenience would have been that the corner slabs would have occupied the *inner* angles of the room instead of detailing round its *outer* angles, but all would have been intelligible, and the procession might have been read as in the days of Pericles; gaps only occurring where parts of it are for ever unfortunately lost. But a still better way even than this, if one could but for a moment conceive such an expensive thing to be possible, would be to construct a building with a court-yard in the centre of it of the exact size of the "cella," and to arrange the slabs round the *outer* walls of it, so that it should be in very fact a precise and accurate representation of the cella wall of the temple: the angle slabs would then be right, and the dividing line of the procession seen as in the temple. But of course this is too ambitious a thought, and we only suggest it for the future.

We are here only aiming at a few general thoughts and hinting at one or two improvements, and simply wondering at the way in which things are done now-a-days. We have already noted the marble-cleaning process, and hoped some one would have told us *how* it has been done. We would, with all possible respect, now ask—Mr. Westmacott having denied all knowledge of such things—what has been done to the *plaster* casts of those slabs in the foreign collections? They outshine the very marble itself in brightness and newness of look, and do verily appear to have been washed perfectly clean. What a pity it seems. Common plaster, if simply *oiled once*, and left for time to do its work, is hardly to be distinguished from marble or stone; no colour can be better, or more sculpturesque: what, therefore, can have induced the powers that be to go to work as they have done, and paint, or wash, or "gelatine" all the plaster up to the high-water mark of a newly-painted fashionable street door, and to utterly destroy—and this, at all events, will not be denied—all the *harmony* of colour between the marble and the plaster surfaces. There is now in the new square room at the end of the "Elgin Room" a *plaster* slab, which it is impossible to tell from marble at first sight—no colour can be better—why, we would ask, should so good an accident be brightened up to the tone of Bath-post paper? So much for the colour of *plaster*; the colour of the marble we lamented over before, and regretted that it should have been so unwisely treated as it has been.

It seems almost impossible to comment on such doings in the British Museum without going into a perplexity of details which would probably be of small interest to all but a very few very thoughtful persons: indeed, to say all that is needful and *convincing*, it would be necessary to write a specification of works required to be done at the Museum; but we may be allowed, perhaps, to hint at yet one or two other things of no small moment. Confining ourselves to this small new room, what a chance was there with but a fragment of an idea out of the jog-trot of the "office!" Why was this room sky-lighted like a railway refreshment-room, and the glass of it painted or plastered over? In a room lighted in this dull helpless way there is, and can be, *no shadows* anywhere, for the light in it is too uniformly diffused: it comes from no single point, but from everywhere. The most perfectly lighted room for artistic purposes in the world is probably the Roman Pantheon, with its huge round eye large enough to throw in light, but not large enough to diffuse the light through it all over the whole space to be lighted. An object placed on the wall of such an apartment is thoroughly well lighted, and well seen, but not too much lighted, and the light in it thus let in throws shadows. Sculpture is half lost where there are no shadows. A round or square hole in the ceiling of this room one-fourth the size of the present lantern would have been all-sufficient, and, while we are about it, and with a fit of common sense on us, *clear glass*; so that when our poor English smoke-and-fog-enveloped sun does shine, and show himself, this for-ever-blessed sunlight may at times come in and illuminate the bewashed marbles; for surely never, from the hour they left the great temple for which they were sculptured, have they, up to this moment, caught a glimpse of that sunlight in which, and by which, they were carved into a living existence.

CONVENTION OF AMERICAN INSTITUTE OF ARCHITECTS.

The fourth annual convention of the American Institute of Architects commenced Nov. 9th, Thomas U. Walter, LL.D., vice-president of the Institute, in the chair, and was inaugurated with the reading of the annual address by Mr. Walter, which showed that the progress of the Institute during the past year has been decided and healthy. "Its influence for good has been felt throughout the country, and its respectability as an exponent of a noble and honourable profession is all that could be desired."

At the evening session of the Convention, Mr. P. B. Wight, secretary of the Convention, read the report of the Board of Trustees on Competition for Architectural Works. The Convention devoted the remaining portion of its evening session to the consideration of a schedule of terms regulating open and close competitions for architectural works proposed by the Board of Trustees, which, with slight amendments, was unanimously adopted.

The following is the schedule of terms regulating open and close competitions for architectural works, recommended to all architects, building committees, and proprietors throughout the country:—

1. The instructions must not require more drawings or estimates than are necessary in order clearly to explain the design, and should require that all the designs submitted be drawn to a medium scale, which must be clearly defined, and that all perspectives required be drawn to the same scale as the geometrical drawings, and on a plane at the corner of the building nearest the point of sight; a deviation from which will cause their rejection.

2. In case the amount to be expended is limited, the instructions must state that an excess of 10 per cent. on the expense of executing any design, over and above the sum mentioned, will exclude it from the competition, the amount of expense to be estimated by the professional experts in the jury; and in case the amount to be expended is not fixed, then the competitor may use his own discretion as to the costliness of the design which he makes.

3. A design will be excluded from the competition if sent in after the stated period, and if it contains deviations from the instructions. If, from any of the above reasons, all submitted designs are rejected, then the jury are bound to publish reasons which led to their verdict.

4. The period given for preparing the design must be long enough not only for perfecting a design and preparing the necessary drawings, but must make some allowance for the ordinary occupations of competitors. An explicit statement must be given as to the time when the decision on the merits of the designs is to be rendered, and that all designs shall be returned to the authors of the same. An architect's drawings are his own private property, unless paid for, in which case they are for the sole use and benefit of his client; but the actual drawings still belong to the architect who made them.

5. The designs should be submitted to a jury of experts, whose decision is to be final. One-half of the jury should be architects, and, in case of an open competition for a public building, they should be selected by the Institute of Architects or its Board of Trustees, the other half to be appointed by the Building Committee or owner. The jury must be named in the instructions, which they shall have sanctioned before publication. No person can be competent to serve as juror who submits a design, or is in any way interested in any design submitted, or who has not renounced all intention of participating in the execution of the work.

6. All designs submitted, in open competitions for public buildings, should be publicly exhibited two weeks before the decision is made.

7. In the case of open competitions the first premium must not be less than the amount which the architect would have received had there been no competition, and at least an equal amount should be divided among the other competitors, according to the merits of the designs submitted.

8. It is recommended that, in close competitions wherein the number of competitors is limited, a sum equal to the full value of one design be divided equally among the authors of all except the premiated design, which shall be compensated for as provided in the last preceding rule.

9. The instructions must state that in case the building is erected after any of the designs are submitted in competition, it must be given in charge of the author of the first premiated design, who is to be employed at the usual compensation; and if any other designs, or part of designs, are used, it can only be done with the consent of the authors of the same, and they must be compensated for the full value of the designs or parts of designs used, irrespective of the premiums that may have been awarded.

10. The premiums must be awarded, under all circumstances, for the designs which may have been admitted in competition.

11. It is recommended that, in the schemes of competition, it shall be provided that the names of the competitors shall not be known to the jury."

A special committee of five was appointed to compile a pamphlet defining the exact duties and reponsibilities of architects, their relations to each other, to their clients, and to the various parties under their control; and to give definitions and explanations of the schedule of charge, and any additions to them that may be thought necessary; and to present the result of their deliberations to the next convention of the Institute; such report to present what is, rather than what should be, the best practice of the profession.

THE FEMALE SCHOOL OF ART.

A selection from the year's work of the students, and especially the rewarded specimens, have been exhibited, as of old time, and on Friday and Saturday last the House in Queen's-square, Bloomsbury, was thronged with the friends of the pupils and supporters of the school. The Queen's Gold Medal has been awarded to Miss Emily Selous (who distinguished herself last year), for a well-modelled statuette of the Discobolus. The same lady exhibits a beautiful head of the Saviour, and models of hands and feet, showing much skill. Miss Whiteman Webb and Miss Edith Boyle have each fairly won a national silver medal, the latter by a design for a screen. Miss Julia Pocock, the Queen's Medallist of last year, and National Bronze Medallist of this, is versatile in her talents, and exhibits, besides an ably modelled statuette from the antique and a Venus, paintings and drawings of heads from the life and fruit. Miss Alice Ellis and Miss Alice Locke (the latter for a charming drawing of the *Lilium Lancifolium*), have each received a national bronze medal. National book prizes (5) have been gained by Miss Banks, Miss James, Miss Hancock, Miss E. Selous, and Miss W. Webb; while what are termed local prizes (in competition only with their fellow students, that is), are awarded to Miss Banks, Miss Bluson, Miss Boyle, Miss Berkeley, Miss Ashwell, Miss Clarke, Mrs. Carter, Miss Cooper, Miss Canton, Miss Ellis, Miss Gibbons, Miss Hancock, Miss Heutsch, Miss Hopkinson, Miss James, Miss Hart, Miss Locke, Miss E. Manly, Miss Moore, Miss Macaulay, Mrs. Pickering, Miss Pocock, Miss Selous, Miss Sampson, Miss Ralph, Miss Tegetmeir, Miss Williams, and Miss W. Webb,—twenty-eight in all.

We are glad to see evidences, if at present somewhat immature, that the composition class is at work. Miss Lamb and some others show talent in this direction, and Miss Annie B. Slous, when she has acquired the power of drawing, will make an illustrator.

We hear lamentations that designers of some skill who have left the school (and these, after all, are rare) and are engaged with manufacturers, are able to obtain only very small pay. This is to be regretted. We should be glad to learn the real cause.

EXPENDITURE ON ROYAL SCHOOL FOR OFFICERS' DAUGHTERS.

The two honorary secretaries have resigned, and have published a letter showing wasteful expenditure. They say:—

"To prove that we are not taking action without cause we submit the following facts:—The school at Lansdown (known as Lansdown College), which was purchased for the sum of 4,500*l.*, has had expended upon it to prepare it for the reception of only 70 pupils, the sum of 21,745*l.* 1*s.* 6*d.*, besides the additional sum of 3,104*l.* in furnishing."

"The digging of a well, the contract for which stands thus in the minutes:—'To construct a well at a sum of from 100*l.* to 150*l.*, as deep as may be necessary,' but the cost of which, altogether, has not been less than 1,100*l.*, because, to remedy a defect in it when water was found, a plan was adopted unauthorised by any entry in the minutes, which proved abortive, and thus absolutely sank in the earth, and wasted not less than 700*l.* of the above sum, the well being now in precisely the same state as it was before this extra outlay was incurred."

"The building of a gardener's cottage, the first estimate for which, 200*l.*, was considered too high by some of the committee, and ordered to be reduced, but which has, notwithstanding this, been built at a cost of 470*l.*"

"And, lastly, the building of a wing to the school, consisting of little but outside walls, which appears, by the total sum put down for 'contracts' during the past year, to have cost, apart from the charges for superintendence of the work, &c., the sum of 1,932*l.*, the total for contractors alone being 2,411*l.* 18*s.* 6*d.*, without the addition of a single pupil to the institution."

The result of such management is that the direct cost of the education of each girl in the Bath School, including the office expenses in London, is not less than 57*l.* per annum, as

against only 43*l.* in the Royal Naval Female Schools. The whole cost, direct and indirect, or loss to the public, allowing 3 per cent. on the outlay on the premises, and 20 per cent. (the usual rate) upon the wear and tear of perishable articles, is not less than 80*l.* per head per annum: in the junior school lately set up, it is at present much more. Interference is needed.

STARTLING TENDERS.

SIR,—Now the question of builders' tenders is being ventilated, if you can find room for the following statement of an at present inexplicable difference, it may bring forth some explanation. Together with some eight or nine other builders, I gave in an estimate for the joiners' and other fittings at the Small-pox and Fever Hospitals at Homerton, at the end of last month. The highest tender was 490*l.*, the lowest 150*l.*! I think this is the greatest difference in tendering yet *published*. The committee called in some of the lowest, and questioned them as to their knowledge of the construction of joiners' work, as well it might.

S.

It has not yet been revealed to the public what decision was arrived at by the committee, which in justice each builder ought to have heard.

THE UTILISATION OF PEAT.

A PAPER on this subject has been read at the Society of Arts, by Mr. Robert M. Alloway, M.A., in which he described a simple process whereby peat was converted into peat coal of a density like wood. This was done without any expensive machinery, and in a way resembling brickmaking. The peat was dug in the winter, and broken up so as to destroy its elastic structure. It was then thrown into water-holes. This was the winter's work. In the spring, and from April to November, the moulding and drying processes took place. The peat was moulded into "pats," and these were laid on rough tables, where they lay for about three or four days, and were then placed in wooden sheds of open lattice-work for storage, and very soon afterwards were fit for sale and use.

A long discussion followed the reading of the paper, in course of which Mr. Alloway's statistics as to cost and profit were disputed.

AN APPOINTMENT VACANT.

WE are asked to mention that there is now a vacancy in her Majesty's Office of Works, Whitehall-place, for a technical clerk, at a salary of 150*l.* a year, rising to 300*l.* (10*l.* a year), with prospects of promotion if duly qualified. Any one between the ages of eighteen and thirty desiring the appointment, who has been properly educated under an architect, should apply to the Office of Works, as the appointment will be conferred on the best-qualified applicant.

STRENGTH OF BRICKS.

EIGHT bricks from the works of Mr. D. W. Barker, of Worcester, sent last month as an average to Mr. Kirkaldy's works, gave the following results when submitted to "crushing stress." The bricks are machine-made:—

Test No.	Description.	Dimensions. Inches.	Base area. Square inches.	Stress in Pounds when Cracked slightly.	Cracked generlly.	Crushed Steelyard dropp'd.
E.						
1560	"Pressed" recessed top and bottom	3·20, 9·14 × 4·50	41·13	45,680	86,220	91,180
1557	Do. do. do.	3·20, 9·14 × 4·50	41·13	45,590	79,775	90,320
1559	Do. do. do.	3·20, 9·14 × 4·50	41·13	38,760	77,830	89,640
1558	Do. do. do.	3·21, 9·14 × 4·50	41·13	36,180	70,960	85,820
	Mean		41·13	41,552	78,696	89,240
	Pounds per square inch		.....	1010	1913	2170
	Tons per square foot		.....	65·0	123·0	139·5
1563	"Builders'" recessed top and bottom	3·20, 9·30 × 4·50	41·85	40,960	97,240	113,230
1562	Do. do. do.	3·21, 9·30 × 4·50	41·85	39,280	95,270	106,530
1564	Do. do. do.	3·20, 9·30 × 4·50	41·85	36,490	87,382	101,202
1561	Do. do. do.	3·20, 9·30 × 4·50	41·85	33,540	81,180	95,840
	Mean		41·85	36,490	87,382	101,202
	Pounds per square inch		.....	872	2·88	2418
	Tons per square foot		.....	56·1	134·2	155·5

Bedded between pieces of pine, quarter-inch thick, and recess filled with cement.

OLD BIRMINGHAM.

AT the inaugural meeting of the Archæological Section of the Midland Institute, Mr. S. Timmins read a paper upon "Old Birmingham." Old Birmingham, he said, would furnish much material for the work of the Archæological Section. Though the motto of the town was "Forward," it must not make them blind to the necessity of looking backward also, and of seeing what had been done in the past, that they might know what to do hereafter. If experience was the greatest treasure which long life afforded, a history of centuries must be a most valuable element in the present and future of a town like Birmingham. Birmingham had too often been looked upon as a modern town, and, compared with Coventry, Kenilworth, and Warwick, its claims to antiquity seemed rare and small. Still, if they looked back, they would find that it had an antiquity, and a clear and definite history, not often equalled or surpassed. The paper gave a brief sketch of the leading features in the history of Birmingham, the derivation of its name, the establishment of its fairs, its description by Leland in 1538, the founding of Deritend Chapel, its manufacture of swords in the seventeenth century, and of guns in the eighteenth, &c. Birmingham had a history well worth studying, of which they knew but little, but of which they should, could, and ought to know more. It had been thought necessary in the first degree that an archæological society should exist to explore the past and preserve what was passing in the present for future use. At present Birmingham had no written history worthy of the name. The admirable volume by Hutton was unfortunately written by a very busy man before the science of history was understood, and without any of the research by which old facts were found. That it was an excellent work, but not a history, must be the modern verdict on Hutton's book. The late Mr. Hawkes Smith commenced a history on a more accurate plan, but he left his work unfinished, although its value as a fragment was a great and deserved success. His son, Mr. Toulmin Smith, a man unusually qualified for the work, had barely commenced at the time of his death. It was for the Section to gather up the fragments that remained, that nothing should be lost, to note down old facts which illustrated their history, and to collect and preserve old papers, prints, plans, maps, directories, books, pamphlets, handbills, &c., which, though seemingly worthless now, might contain some scraps of facts which would be eagerly devoured by a succeeding age. Already much had been done by private efforts to collect the materials for a history of Birmingham, and not a few of their townsmen, native and adopted, had shown deep interest and intelligent care in the story of their local life. The Archæological Section had been established with a view and hope of making valuable contributions to their industrial and social history.

ST. ANDREW'S, WELLS STREET.

SIR,—I thank you for your kind notice of my Parochial Festival. Will you kindly allow me to state, in your next issue, that the architect of the new schools for St. Andrew's, Wells-street, to which you refer, is not Mr. Street, but Mr. James Deason. Mr. Street is only responsible for the reredos in St. Andrew's Church.

BENJAMIN WEBB, Vicar.

*** Mr. Street obligingly writes to the same effect.

PAROCHIAL ASSESSMENTS.

INSTITUTION OF SURVEYORS.

AT the meeting of this Institution, on the 28th ult., Mr. Henry Crawter in the chair, Mr. Edward Ryde continued his paper on "Parochial Assessments." First giving an account of "The Valuation (Metropolis) Act, 1869," he treated fully of the Rating of Railways. We print the introduction to the latter inquiry, and refer readers professionally concerned to the paper itself:—

In its broad principles, the occupation of a railway company does not differ from that of a farm, and we have to apply to it the same general law. In each case the rate must be made upon an estimate of the net annual value of the several hereditaments rated thereunto,—that is to say, the rent at which the same might reasonably be expected to let from year to year.

If the railway and its stations are situated wholly in one parish, the rent which a tenant might reasonably be expected to give for the entire property is comparatively easy of demonstration. But difficulty arises when, as is usually the case, the line and its stations are situated in many parishes, and the rating for one parish only is the subject for consideration.

Attention will first be directed to the more simple case, and the method of ascertaining the rateable value of an entire railway and its stations will be explained.

The first element of value is what is called the gross receipts of the railway, that is to say, the total yearly earnings of the line from all sources of traffic. The second is the working expenses or the outgoings which a tenant has to make in earning the gross receipts.

The balance of gross receipts which remains after deducting the working expenses, is called the net receipts, and is the fund out of which the tenant's profit and the landlord's rent must come. Of these it is obvious that the tenant's share must first be provided, because, to take an extreme case, if the net receipts should be found to be insufficient to afford him a proper tenant's profit, he would give no rent to the landlord. But a sufficient tenant's profit being provided, the balance of net receipts remaining is the rent which he might be reasonably expected to pay.

From this rent a further deduction has to be made to countervail the depreciation which takes place in the value of the permanent way, and to maintain it in a state to command such rent. The amount of this deduction is the sinking fund, which would be required to be laid by yearly to produce a sum sufficient to renew the railway and works at the period of their ultimate decay.

A hypothetical valuation by way of illustration is appended to the paper.

In estimating the occupier's share in valuations of this kind, 5 per cent. for ordinary interest on the tenant's capital, and 10 per cent. for trade profits, are usually allowed. The arbitrator in the case of the Great Eastern Railway Company and Haughley Parish found these two amounts to have been properly deducted. It is, indeed, obvious that, as regards the interest, a tenant requiring to borrow his capital on the security of his rolling stock, would have to pay as high a rate as 5 per cent. per annum, or, if it were his own capital, he should be allowed that rate of interest, because he would have no difficulty of obtaining it from a person offering the same security. It may also be presumed as reasonable that no tenant would be satisfied to calculate on a less amount of profit than 10 per cent. on his capital, when taking into account the rent he would pay to his landlord.

Five per cent. is also very commonly taken as a proper insurance fund against risks and casualties, and 5 per cent. for depreciation of rolling stock. These items are more speculative in their character than the former ones; but, being so, a tenant would probably take care to be on the safe side, and it is not unreasonable to suppose he would undertake to give a higher rent than would allow him to make ample provision for these contingencies. The depreciation of rolling stock will be more or less according to the sum expended from time to time on its repair.

The question of amount of tenant's capital has been the subject of judicial decision. In what is known as the North Staffordshire case, it was decided that the amount of tenant's capital is to be the actual value at the time the rate is made (and not the cost price) of the rolling stock and of the movable chattels.

Eu things so attached to the freehold as to become part of it, and things which, though capable of being removed, are yet so far attached as that it is intended that they shall remain permanently connected with the railway or the premises used with it, and remain permanent appendages to it as essential to its working, are not to be taken as things which an incoming tenant would have to purchase of an outgoing tenant, and for which he would have to provide capital.

The chattels are defined to be things movable, such as office and station furniture. It was also clearly the intention of the Court to include all manner of tenant's tools and implements necessary for carrying on the business of the company.

The fixtures are turn-tables, cranes, weighing-machines, stationary steam-engines, electric telegraph and apparatus, gasworks, and such like.

The allowance in respect of renewal of way was judicially settled in The London, Brighton, and South Coast Railway (Croydon) case. In that case it was decided that, although no charge had, in fact, been made, either by way of outlay or setting apart of the gross receipts, still, if the depreciation be, as it probably is, both certain and capable of an annual average, though not proper to be, in fact, repaid annually, it should be met by laying by a certain sum annually. The judges said,—"We have considered this question with much attention, and upon the whole we think that the company are entitled to a deduction on this head. We cannot make a substantial distinction between this and house property, or any other of a perishable nature which must require renewal; and although we think that the company ought to set apart the sum which they claim to deduct, we cannot compel them to do so in this indirect way. And we think that, whenever the time shall come for actually making the restoration, they will be estopped from claiming more than that annual deduction which they now insist on, exactly as a landlord could not claim to deduct the expenses of restoration made by him of a house."

The amount of this deduction is arrived at by estimating the probable duration of life of the several component parts of the permanent way, and by calculating the sum which, if set aside yearly and allowed to accumulate at compound interest, would amount to the sum required, at a definite period, to reproduce particular parts of the permanent way.

The difference between gross estimated rental and rateable value of lines of railway is difficult to define.

The cost of maintaining the railway is included in the working expenses, and is therefore deducted from the gross receipts before the rental, as described herein, is arrived at.

But the rent which a tenant might reasonably be expected to pay on lease, he providing the sinking fund, for the ultimate renewal, is beyond doubt the rateable valuable of the property.

The second branch of the subject, the mode of determining the rateable value of the railway in one of many parishes in which it is situated, is more difficult to be explained.

ART AND SCIENCE.

At the public meeting of the Oxford School of Science and Art mentioned already, Mr. Vernon Harcourt, M.P., who presided, said in the course of his address,—Art, of course, is not merely the imitative faculty; it is not the mere servile copying of that you see before you,—although that, in itself, is a valuable power, which I do not, by any means, desire to disparage. But there is a greater art than that. There is the creative art, which is born of the imagination and genius of man. The effect of that on the human mind has been beautifully expressed by that great writer who is Professor of Art in the University of Oxford, Mr. Ruskin. I remember that in one of his most beautiful passages he says,—"That man is not to be envied in whose heart the great charities of the imagination lie dead." I think that is a true and accurate expression; and when he speaks of "The charities of imagination," he very finely describes the effect which that imagination operates on the moral character of man. It has been expressed by a poet also, I think, in very accurate terms, when he says,—

"To raise the soul by tender strokes of art,
To mend the manners, and improve the heart."

This is what we mean by art. Allow me, in conclusion, just to say a word or two upon the cognate spirit of science, which is also cultivated in this institution. If art is the power of expressing the sense of the beautiful, science is the study of things that are even greater than beauty—it is the study of the laws which govern the universe, which are the foundation of beauty itself. For beauty arises in its secret springs from that very order which forms the fitness, and constitutes the beauty of nature. We all remember those beautiful lines in which Milton deplores his blindness,—

"All nature left a blank,
And all knowledge at one entrance quite shut out."

But Milton at least had stored his mind with those immortal truths which even in darkness filled his soul with light. But how many among us, not visited with the affliction which Milton suffered, are yet more blind than he—who go through the world having eyes and seeing not, and who hearing do not understand—who see around them the great system of nature, yet know nothing of the laws by which it is governed—who care not to embrace the great opportunities which science offers them of learning those secrets of chemistry which keep all the elements in their proper place—who know nothing of those mysteries of physiology which teach us how we and all living beings are fearfully and wonderfully made; who have read nothing of that great romance of astronomy; who see such signs as we have witnessed to-night in the heavens, and know nothing of those great electrical powers which produce the beautiful Aurora which is now blazing in the sky. Yet all this knowledge is available to those who go through life more like the beasts that perish, because they will not be at the trouble of studying these great truths and these sublime verities with the eyes of science. These men can look night after night on the stars in their courses, yet know nothing of the history that they tell—nothing of the truths which they reveal, of which the poet speaks when he says—

"In reason's ear they all rejoice,
And utter forth a glorious voice;
For ever singing as they shine,
'The hand that made us is divine.'"

To know and to understand these things is to infuse a spirit and enjoyment into life; but to pass through existence caring and knowing nothing of them does not deserve the name of living; we should say of such a man that he vegetates rather than lives. Science is a study of these laws of nature, which it not merely explains, but enables us to imitate; and, as in the case of the steam-engine and other inventions, it possesses almost creative faculties. A close study of the works of God seems to impart to man something of that God-like faculty which endows him with some portion of the power of creation. It is because these studies develop the faculties of man,—because they expand those great gifts which God has endowed our immortal being with,—they are studies which every community ought to cultivate as pursuits calculated to make its members fit to be members of a civilised nation and of a Christian people.

SMALL HOUSES IN THE SUBURBS.

I hope you will not consider me intrusive in asking your favour for the insertion of a line respecting our new suburban small houses, especially the class of house consisting of ground and first floors only. Now, I consider and think I can show that this sort of house is the worst that can be designed, if I may use such a term. In the first place, you have a front parlour, which, after taking off the passage, is only 12 ft. wide. Then there is a small back parlour, which is not large enough for a small table. Of course, the idea is to throw open the two rooms when required, by opening folding doors. When this is done, you see two rooms, each with a fireplace, and requiring two suites of furniture, which runs a man to unnecessary expense; and when all is done, you have a very long room, but disproportionately narrow. But this is not the worst feature in this kind of house. After wasting a great deal of passage room, you come to a very small kitchen, say about 11 ft. by 9 ft., which is a very uncomfortable place for even a very small family; in fact, it is all heat and draught. After the kitchen comes a scullery, with a door into a yard or garden.

Now the front passage, doors of kitchen, and scullery are all in about one straight line, causing a tremendous draught, and offering a very pressing invitation to rheumatic or other chronic complaints.

The houses I have sketched seem to abound by thousands, and certainly look nice and tasty outside with their bay windows and small gardens. But the real comfort of a house is inside.

If the two parlours be kept nicely furnished, a tasty wife does not allow them to be continually used, especially where there are children. Where, then, is the good man to comfortably sit and spend his evening? As I have already shown, the kitchen is hardly large enough to turn round in.

The question is, what kind of house should be built for one who, in spite of moderate means, must and is determined to be a "gentleman?"

In answer, I would say, first of all, see that there is a good-sized kitchen, with say painted walls, and which, if comfortably furnished, would be a useable room, instead of destroying a great amount of comfort, by fitting up a sanctum that can only be entered upon state occasions.

Another thing, the number of poking rooms I have described cause a great deal of house-work.

T. H.

HIGH ALTAR IN THE CHURCH OF ST. CATULLUS, MOOSBURG.

We have several times alluded to the fine Minster Church at Moosburg, in Bavaria.

The interesting and picturesque little town of Moosburg is situated between Friesing and Landshut, that part of Bavaria which is so rich in relics of Mediæval times. It is essentially a pretty town, both as to its situation on the Isar and its architecture. It contains three churches, two of which nearly join one another. They are the Minster Church, or St. Catullus's, and St. John's.

The Church of St. Catullus, or the Minster, is a large Romanesque building consisting of a long nave and aisles of the earliest Romanesque style, very similar to the oldest portions of St. Alban's Abbey Church. It has a lofty quadrangular tower, which is rather later in date than the nave, and is adorned with a series of arcades of semicircular arches. The choir and its five aisles are of the fifteenth century, and contain a magnificent high altar and stalls. The stalls have been previously illustrated in the *Builder*, and the high altar forms the subject of the engraving in our present number. This remarkable example of ancient woodwork dates from the year 1462; and an inscription let into the east end of the apse relates that it was given to the church by Louis, Duke of Bavaria, in that year. The Louis referred to was Louis "the Rich." This Mediæval Crœsus was certainly no miser, for this altar is about as elaborate a work as is to be found in the whole of Germany. It is nearly 60 ft. high, and every portion of it is carved with a delicacy and finish which we have never seen surpassed. The paintings on the valves of the small "aumbry" containing the shrine are the works of the eldest Holbein (the grandfather of the celebrated portrait-painter). They represent, when closed, the family of Louis "the Rich," with their various patron saints, and the canons of the Church of St. Catullus; when open, the "Nativity" and the "Annunciation." These pictures were for some time in the gallery at Munich, but were returned by the late King Louis of Bavaria, when the high altar was restored. The shrine enclosed in this aumbry is modern, as is also the antependium of the altar. At the back of the altar is a beautiful picture of the "Carrying the Cross," also by the eldest Holbein. The statue of the Madonna in the centre niche of the reredos, is about 8 ft. high. It is a most superb figure, full of expression and grace: the drapery is perhaps a little too angular, but this is the fault of all German figures of the same date.

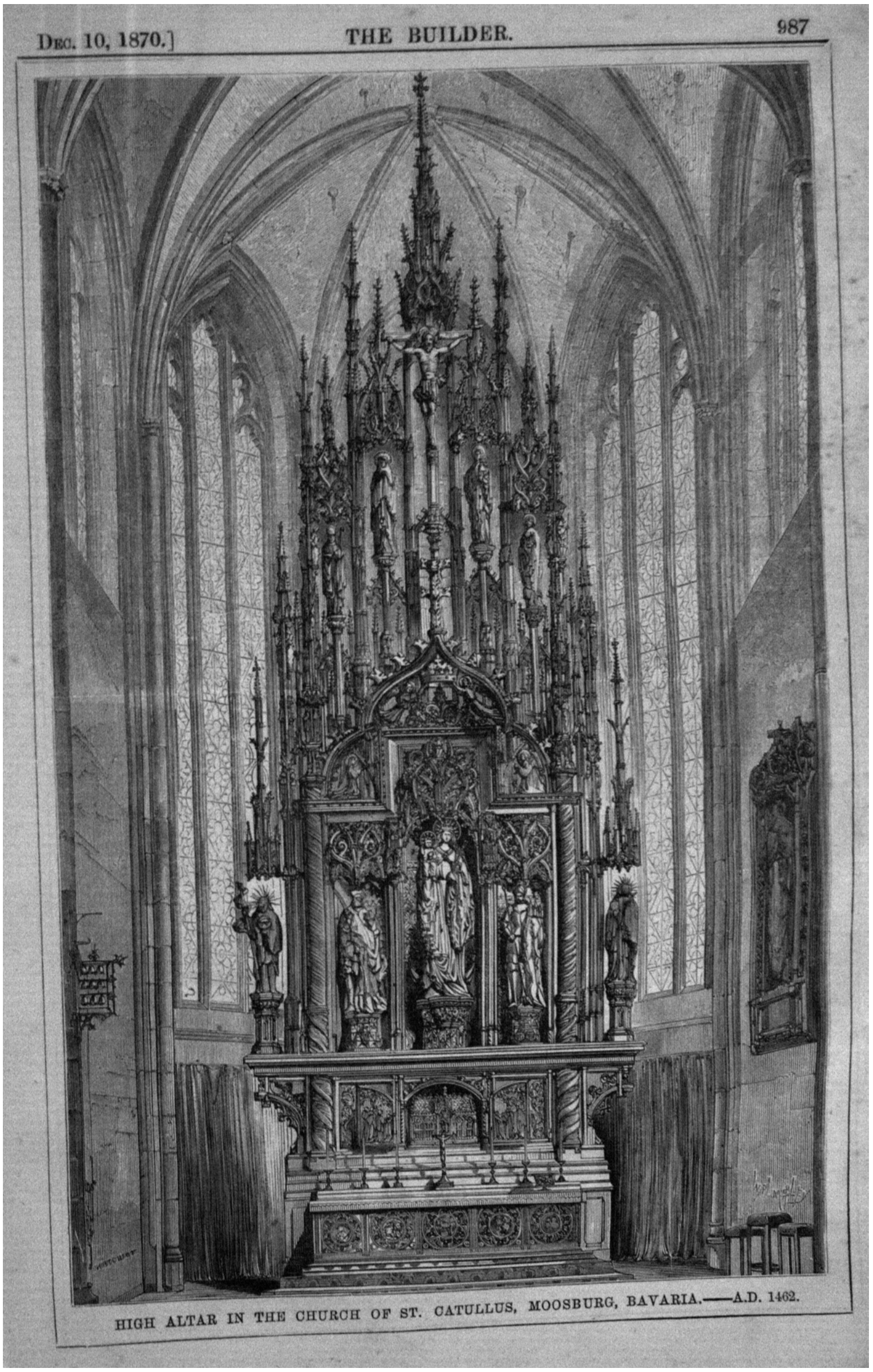
The whole of this altar is beautifully decorated with gilding and colour, which has been carefully restored. Great effect is obtained by using gilding of two different colours, the one alloyed with copper, and the other with silver.

In addition to this altar and the stalls previously engraved, the church contains several old monuments, one of which is shown in our engraving. It is a tablet of red marble, richly carved in the latest style of Gothic architecture. There are a second ancient altar, a well-vaulted organ-loft, supported upon marble columns, and a very rich but rather barbarous western doorway. The whole building has been recently restored by subscription, raised in the town and neighbourhood.

THE ROYAL ALBERT HALL OF ARTS AND SCIENCES, SOUTH KENSINGTON.

THE NEW BUILDINGS FOR ANNUAL INTERNATIONAL EXHIBITIONS.
As seen from the Royal Horticultural Gardens.

[See p. 977, *ante*.



HIGH ALTAR IN THE CHURCH OF ST. CATULLUS, MOOSBURG, BAVARIA.——A.D. 1462.

ON LABOUR AND STRIKES.

AT the Co-operative Hall, New York, on the 14th ult., Mr. Mundella lectured on "Strikes, Arbitration, and the Civil Service in Great Britain." In the course of his address the hon. member said:—The relations of capital and labour is the question to which I invite your attention, and I would ask you to consider the conditions under which we approach the solution of this and all other social problems as compared with yourselves. You are an old people in a new country, possessed of all the experience which centuries of European success and failure have given you. You have no trammels of caste, or prejudice, or ancient institution remaining to overcome. We, on the contrary, are in an old country, where all the resources of nature are already appropriated; where laws, traditions, institutions, require to be changed; where we cannot build up without first pulling down. More than all, we have a dense population in a sea-girt fortress without power of extension or expansion. The tendency of industry everywhere is to localise itself. We have our iron and our coal districts, our cotton and our woollen districts. Ribbons are only made in Coventry, cutlery in Sheffield, lace in Nottingham. Wherever numbers are congregated engaged in the same industry, community of interest and sentiment is certain, sooner or later, to bring them into association. Trade-unions are the natural consequence. Combination is good in itself if wisely directed. It is only to be deprecated when the means it employs and the ends at which it aims are not conformed to order and good government. It is, alas! too true that trade-unions have often been managed by misguided men, have aimed at impracticable and injurious ends, and have stooped to intimidation, outrage, and crime. In my country I believe these evil days are fast passing away. The spirit of intelligence and the growth of co-operation, arbitration, and industrial partnerships are raising the condition of the workmen, making more pleasant the relations betwixt the employer and the employed, narrowing the area of strife, and rendering strikes less frequent and less aggravated. In all the large, well-conducted trade-unions of England strikes are now of very rare occurrence and of very short duration. Still, both in England and America, there is a large class which is bitterly hostile to combinations, forgetful of the fact that labour can only stand on equal terms with capital when it is associated. Combination enables the workmen to deal on equal terms with the capitalist. Invariably the power possessed by each has been exercised in turns to enforce unreasonable demands on the other; and strikes and lock-outs, in the absence of any reconciling influences, have been the result. I cannot recall a strike, in my experience, which has not been attended with natural and moral injury to the parties engaged. I could enumerate several in which the pecuniary loss has been from 500,000*l.* to 1,000,000*l.*; and the moral loss beyond all computation. If I have correctly informed myself, you are able to point to examples equally deplorable. The evil of strikes will, I think, be so generally conceded, that I need not detain you further with proofs. If, in describing remedial measures, I appear to give undue prominence to boards of arbitration, I beg it may not be understood that there is any conflict of opinion between Mr. Hughes and myself. I am a sincere advocate of co-operation and industrial partnerships.

LEICESTERSHIRE GRANITES.

SIR,—Your issue of Nov. 12 (p. 902) contains a well-written article upon the subject of the Leicestershire granites, which, after giving a description of the method of working at Mount Sorrel, proceeds to give the results of experiments upon the specific gravity of samples from the respective quarries, and appends a series of four tables relative to the weight and bulk of a foot of each class of rock, and the quantity of each description required to pave or coat an equal area.

As the question of the relative values of materials for the construction and repair of streets in towns is one of great interest to many of your professional readers, and, in fact, forms one of the subjects for premium during the ensuing session of the Institution of Civil Engineers, I trust the writer of the article will pardon me for presenting the subject of the specific gravity in one other aspect in addition to the very useful ones which he has enumerated.

Table IV. gives the relative weight of each description of stone required to cover an equal area; the Mount Sorrel Company's material being placed at the minimum, and the Charnwood Company's at the maximum, the difference being as 100 to 110,—the natural inference being that the one is more economical than the other by the value of ten tons of material in every 100 tons used, and this position would undoubtedly be correct presuming that the materials were capable of an equal resistance to crushing stress.

I have frequently noticed in practice that it may be taken as a general rule that the specific gravity of any stone or rock is a general measure of its hardness or resistance to crushing stress, and also that the readiness of any of the harder rocks, such as granites and syenites, to cleave, or, technically, "cut," may be regarded as a certain indication of their brittleness, and a proof that they lack the great essential of durability and economy in road-making, viz., toughness. This is very clearly shown in some of the basalts, which cut with a smooth, almost glassy surface, and are nearly as brittle as the substance whose fracture they represent.

In practice, therefore, it will be found that a greater bulk for an equal value is not *always* the most economical to use, and the safest test to apply is that of durability; and the only sure guide to this is by practical experiments with the respective kinds of material, laid down at the same time upon a continuous length of roadway. The force required to crush cubes of equal area of the various samples is, however, a good indication of the money value of granite for macadamising purposes; and as the respective firms have furnished them to me from time to time, I give them in a table below, in which I have also included the information contained in the tables supplied by the writer of the article:—

Article in the "Builder." *Mr. Kirkaldy.*

Quarry.	Specific Gravity.	Weight of a cubic foot in pounds.	Number of cubic feet in a ton.	Quantity of each kind required to cover an equal area. Tons.	Crushing force per square inch, in tons.	Crushing force per square foot, in tons.	Remarks.
Other Granites (Beardmore).							
Mount Sorrel Company	2·659	166·19	13·48	100	17·388	1·118	These crushing weights are probably a minimum, as the strength increases more than as the square of the dimensions.
Groby Company	2·775	173·44	12·91	104	—	—	
Bardon Hill	2·827	176·69	13·67	106	20·743	13·34	
Markfield	2·831	176·94	12·65	106	19·666	12·28	
Charnwood Company	2·935	183·44	12·21	110	27·143	17·45	
Cornish Granite	2·62	163·75	13·5	...	8·000	...	
Aberdeen	2·625	164	13·5				
Red Egyptian	2·654	165·88	13·5				

It will be at once seen by reference to the last two columns of the table that the heaviest stone is decidedly the strongest, and most likely to withstand the wear and tear of heavy traffic for a considerably longer period; and when to this is added the discomfort to the public, and the damage to carriage-wheels occasioned each time a fresh coating of macadam is required, the apparent saving by using the lighter material becomes doubtful, and the probability is that the more dense stone will in the end be the cheapest.

GEORGE HODSON, Assoc. Inst. C.E.

SOUTH WARNBOROUGH CHURCH.

THE parish church of South Warnborough has been re-opened by the Bishop of Winchester, after undergoing restoration, and a new south aisle and organ-chamber being built. The original edifice contained only nave and chancel. During the restoration there have been found several moulded and carved stones of the Norman period. These have been preserved and built in the new work, in such a way that the best specimens may be seen in the south-east inner angle of the vestry. The original north doorway, of Norman work, is intact. The colour, wash, and plastering have been cleaned off. The stonework and carving are in good preservation, which is partially due probably to the existence of a porch, but more particularly to the kind of stone it is executed in. There are two kinds of stone used, which would lead one to suppose parts were reworked from the stone of an earlier edifice. There is also a very small window on the south side of the west end of the nave, with very deeply-splayed jambs, with semicircular head, which is probably older than the north doorway. The work is very rudely wrought The other windows are of different periods, from thirteenth, fourteenth, and fifteenth centuries. The south arcade, dividing the aisle from the nave, is composed of three arches, carried by two pillars, with moulded bases and capitals. The east and west responds are moulded corbels. The roof of the new aisle is a lean-to, of Baltic timber, wrought and left clean from the tools, boarded on the back side, and covered with felt and 8 lb. lead to the foot. The nave and chancel roofs have been restored and retiled, with ornamental tile crest. The inside of these roofs has been stripped of the lath and plaster, and cleaned, and plastered between, leaving the roofs open. A decided improvement has been effected in the acoustics of the fabric. The old tower and spire were taken down, being in a dilapidated condition, and have been re-erected in English oak, and covered with shingles, surmounted with an iron cross and weathercock. The tower contains at present the three old bells, re-hung in a new frame, arranged so that another may be added to the peal. There are four stained-glass windows; two of them are memorial windows, by Clayton & Bell; the other two are of old heraldic glass, arranged by the same. The other windows are glazed with cathedral plate-glass, in two colours, from the design of the architect. The passages in the nave, aisle, and the whole of the chancel are laid with tiles from Lugwardine, from a special design; some of the encaustic tiles were copied from old ones found during the restoration. The altar-table is raised five steps above the level of the nave floor; on each space the design for tiling is different; the steps are of Portland stone, with glazed tile risers. There is a super-altar, of Devonshire marble, from Messrs. Goad's works, near Plymouth. The piscina has been partly restored, leaving portions with the marks of the destroyer's axe. The priests' choir-stalls in the chancel are executed in oak. The chancel-screen is in English oak, of an open design, so as not to obstruct the view of the chancel from any part of the church. The font is placed at the west end of the nave, and is a portion of a very early one; the bowl is new, of Irish marble, polished: it is copied from the pieces of the original, which were found built in the walls, and is now placed under the new one below the floor line. The church is heated by Porritt's patent warm-air stove. The north porch is new, copied from the old, which was very much decayed; none of the material is fit for reuse. The nave, chancel, and porch roofs are tiled with ornamental tile-cresting, purposely made. The pulpit is wrought in Caen stone, executed by Mr. Earp, of London. The nave and aisle are seated with open-bench seats, of Savannah pitch pine, selected, and varnished. The lectern and sedilia are executed in wainscot oak. The contractors were Messrs. Lee & Hale, of Odiham, and S. Warnborough. The whole of the work has been executed from the designs of Mr. G. E. Street, architect. Mr. Jas. Redden superintended as clerk of the works.

GREAT EASTERN RAILWAY EXTENSIONS AND THE HOMES OF THE POOR.

THE works of this line are making weekly a perceptible advance. Through Bethnal-green, across the top of Hackney-road, over Dalston-lane, under the North London Railway, and on thence to Walthamstow, evidences of progress

may be witnessed in brickwork, embankments, and iron-girder bridges of the usual ugly type. In London, east and north-east, an immense amount of house property has been tumbled down to provide a suitable course and breadth of line. Some of this house property was valuable, but a large amount of it in the Hackney and Bethnal-green quarters was ruinous, and bad or wretchedly built. Bad and good, however, have been swept down, and whole streets and lanes have disappeared. Between the Great Eastern and the North London lines the working classes and the poor traders have fared rather badly. The dispossessed have betaken themselves to the already overcrowded quarters of Shoreditch, Bethnal-green, and offshoots from Hackney-road. A few landlords have been benefited, and a large number of families have suffered. This has ever been the case. It is a great misfortune that works of public utility cannot more often be carried out without inflicting a train of evils. The provision of homes for the poor ought to precede the commencement of all undertakings that necessitate the removal of the poor from their old homes and the centres of their employment.

ST. NICHOLAS'S CHURCH, PORT LOUIS.

With reference to a brief notice in our pages some short time ago, of the opening of St. Nicholas's Church, Port Louis, by his Royal Highness the Duke of Edinburgh, wherein the church is stated to have been designed by the late Bishop Hatchard, the Rev. Dr. Huxtable, Bishop designate of the Mauritius, writes to say that it is quite true Bishop Hatchard laid before the committee a sketch of a small church in Switzerland, taken from a circular asking for subscriptions, which he wished to give the general idea of the sort of church he would like to have built, but that the plans of St. Nicholas's Church are really by Mr. W. A. Mann, the assistant surveyor-general, and present a great improvement on the design shown to him. "Let me add this," says the writer, "the church has been the subject of universal admiration."

WINTER EXHIBITION: SOCIETY OF BRITISH ARTISTS.

Following what we are forced to think the questionable example of the Water-Colour Societies, the Society of British Artists has opened its galleries in Suffolk-street with a collection of pictures, studies, and sketches, as a winter exhibition. It comprises 638 works in oil and water-colours, many of which are of a very agreeable character, but can scarcely claim higher praise. It is unnecessary to particularise: on a bright morning a pleasant hour may be spent in the gallery. Some pictures by the late Mr. Pyne must be regarded as the chief feature of the collection.

ANOTHER MAN'S WANTS.

Sir,—I am desirous of following up the modest wants of your contributor:—

I want each Metropolitan Vestry Board to have the name of the streets printed on the lamps at each end of every street or road, and the number of the nearest house on the intermediate ones, for the assistance of benighted travellers.

I want the country vestries to do the same, and to erect at the junction of all principal roads a properly-directed sign-post.

I want reflectors fixed in the top of every street lamp to throw more light around.

I want a more convenient station erected at Clapham Junction over the existing scattered ones, with comfortable waiting-rooms, instead of the bewildering tunnel at present in use.

I want the waiting-sheds on each side of railway stations to be inclosed, and to be made more cosy.

I want the metropolitan and other railways to have the name of the stations distinctly printed on their respective lamps.

I want the postman's time saved by letter-boxes being fixed at each house, and his journey up and down the City offices stairs prevented by each office having a letter-lift.

I want all cab-stands to be under properly covered erections, with small waiting and refreshment rooms for the men.

I want drunken people to be removed at once to the nearest police station.

I want the river steam-boats to be more respectable, and to have a saloon deck for first-class passengers, leaving the roof and fore-cabin to the second-class travellers.

I want omnibuses to have removable covers over outside seats, so as to enable their being used on rainy days.

I want water-carts to be things of the past, and supply-pipes laid on from the main to every pillar-lamp, and the roads watered from same by means of a removable hose.

I want the same to be always ready for immediate use in case of fire; and, above all,

I want to see other people follow the excellent example set by Miss Burdett Coutts.

Small Bore.

THE "TENDER" SUBJECT.

Sir,—I am glad to find, from the letter of Mr. Dale in your last number, that I have not misunderstood and misrepresented the "Buckingham Palace-road" matter, and have not, therefore, to make the apology or retractation which I promised, had I unwittingly done so. The explanation of Mr. Dale is not quite satisfactory to my mind, for I think that such errors and mistakes as I pointed out in my former communication—which were only samples of many others which I could have adduced—ought not to occur in cases in which a very handsome commission is charged by the architect for taking out the quantities. I also think that in such cases the architect has no right to divest himself of the responsibility of incorrect quantities by putting a protecting clause in the general conditions, behind which he can shield himself from the consequences of them. I have known a great number of high-minded quantity surveyors in my time, and have found that they not only prided themselves upon the accuracy of their quantities, but always acknowledged their responsibility if they made mistakes.

Audi Alteram Partem.

*** Our correspondent deals too tenderly with Mr. Dale's communication. If we were to express our opinion of the explanation given by Mr. Dale, that gentleman would not find it at all flattering.

With reference to Wraysbury Church tower and spire, Messrs. Wright, Brothers, & Goodchild, who sent the lowest tender, write to say, in reply to our printed inquiries, that they took out their own quantities, adding, "a course we invariably adopt when the opportunity is afforded us."

"Further, that we would not have obtained the contract had we shown such want of knowledge of the prices of materials and labour as is displayed by the builder who sent you an abstract of his quantities, we admit; yet we can scarcely be expected to explain to the public how it is that we are able to undertake the work at what may appear so low a cost."

"We think though, sir, that if you were aware, as we are, of the circumstances under which some of the tenders were made, you would not be surprised at the discrepancy between them; but it is not our business to enter upon that matter."

SCHOOLS OF ART AND OF SCIENCE.

The Maidstone School of Art.—The exhibition of drawings by the students of this school has been held at the Corn Exchange. The distribution of prizes by Sir John Lubbock, Bart., M.P., took place at the Concert Hall. The Mayor occupied the chair. The report said:—

"In reviewing the progress of the Maidstone Art Night Class, for this their third report, it is a great satisfaction to the committee to find that the number of students in attendance continues to be so well sustained, and that the classes are self-supporting. The classes have now been held for rather more than three years and a half, having been opened in January, 1867. The success of the students at the annual Government examination has always been very fair, and the number of prizes taken very encouraging to the pupils, and reflecting much credit upon the master. The number of students who have passed through the school from its commencement has been,—Middle-class students, 108; artizans, 88. The total result of the examination this year has been,—Prizes on examination, 7; ditto on drawings sent up, 8; total, 15; being *one* more than we have had previously. Six students have obtained full certificates. . . . . The committee would be glad to be able to commence an Art Library, and would be grateful for gifts of books of that class. Back volumes of the *Builder* or *Art-Journal* would be acceptable."

Science Teaching in Liverpool contrasted with that in other Towns.—A class for the study of elementary mathematics has been opened at the Operative Trades' Hall, Duke-street. Mr. James Hayes delivered the introductory lecture. Mr. James Samuelson presided, and in the course of the evening he congratulated the meeting upon the success which attended the opening of the class for the study of chemistry.

On that occasion nineteen students, he said, registered themselves, which showed that they were doing something to raise Liverpool from the very degraded position which it held in regard to science teaching. Very recently they were told by the borough coroner that in Manchester, Birmingham, Leeds, and London, science and art classes flourished to a considerable extent; but the reply immediately made was that a comparison between manufacturing towns and a seaport was not worth very much. Well, he (Mr. Samuelson) had compiled a statement from the *Directory of Science and Art* which showed the position Liverpool held, compared with that of other seaport towns. Bristol had three schools, the largest number of students in one school being 200, with six masters; Plymouth had three schools, the largest number of students in one being 241; in Southampton there was one school, attended by 146 students; South Shields had four schools, in one of which there were 112 students; there was one school in Aberdeen, attended by 280 students; one in Leith, attended by 289 students; in Belfast there were twenty-two schools, one of which had 122 students; Glasgow—which might safely be compared with Liverpool—had seven schools, one of which was attended by 1,013 students, and another by 500; Liverpool had three schools, the largest number of students in any one being 150, and those were the boys of the Liverpool Institute. Little towns like Lurgan and Newtownards had three schools each, one with 148 students. In 1869-70 there were in all 21,089 persons receiving science instruction in the three kingdoms, of which number Glasgow supplied 1,700; Plymouth, 456; Woolwich, 385; Liverpool, 280; of whom at least 200 were middle-class students; and, by way of contrast, a place called Alexandria (which the Government Directory said was in Ayrshire), 99 students. Mr. Samuelson said they were doing something to raise Liverpool from her degraded position in the matter of science and art-teaching, and he felt sure that it would not be said hereafter that the trade unionists of Liverpool thought only about their pockets. He had never thought so, and he had only been too sorry that gentlemen in the town had not come forward long since and lent them their assistance. That time, however, had not arrived, for Mr. Reade, architect, of this town, had volunteered to give to the members of that hall an introductory address and a course of lectures on the construction of buildings, while one of his assistants had proffered his services in conducting a drawing class."

Mr. Samuelson, in conclusion, expressed the hope that great good would result from those classes.

The Islington School of Science.—A public distribution of science and drawing prizes, with three 15*l.* scholarships, awarded to the students in evening classes and pupils of the Islington Public School by the Science and Art Department at the May examinations, 1870, has taken place in Myddelton Hall, Upper-street, Islington, Professor Huxley, LL.D., F.R.S., presiding. The admission was free, and the attendance was good. Mr. Wheatley stated that in 1862, 12 students passed; in 1863, 21 passed; in 1864, 31 passed; in 1865, 30 passed; while in the year 1866 the number rose to 35. In 1867, 32 passed; in 1868 (the first year of Mr. Angel's drawing classes), 40 passed; in 1869, 55 passed; while at the May examinations this year the total number of successful students was 62. In addition to these successes, four gold medals, two silver medals, and two bronze medals have been awarded to the school, and also two 50*l.* exhibitions, tenable for three years, and three 10*l.* scholarships, the latter having been taken by the boys in the day school. Altogether it was considered that the numbers who had joined the classes, and the great interest taken by them in the instruction, as evidenced by the successful results, indicated pretty clearly the demand that existed in this neighbourhood for scientific instruction. A new session of evening science classes for young men commenced in October of last year. The Rev. Professor Henslow reviewed the work done by the school during the last nine years, and said the general impression on his mind was that there had been a steady progress made in all subjects, with perhaps the exception of vegetable physiology and zoology. Knowing boys as he did, he could say that the school was flourishing, going steadily on, and could not well do better, and this success was in a large measure due to the skill and teaching capabilities of Mr. Howard, the head-master, and Mr. Angel, the teacher. The chairman delivered the prizes, which consisted of volumes, drawing-slates and boards, boxes of paints, chemical apparatus, batteries, &c., to the various successful scholars, shaking hands with them, and speaking a few words of encouragement to each.

The Chippenham School of Art.—This school will probably be closed unless working men avail themselves more generally of the instruction it affords.

Science Examination at Leeds Mechanics' Institution.—Two medals have been awarded to students in the science classes of the Leeds Mechanics' Institution. William Hawksworth, pupil of Mr. George Ward, has been awarded a silver medal in subject 11, organic chemistry, as being the second in the whole of the United Kingdom in this subject; and William Lee, pupil of Mr. Thomas Hick, B.A., has been awarded a bronze medal in subjects 4 and 5, pure mathematics, the third on the list in this subject. These are the only medals awarded to students in Yorkshire science classes, excepting

in navigation and nautical astronomy to students connected with the Hull Navigation School.

The Taunton School of Art.—A public meeting has been held in this school for the distribution of the prizes awarded by the Government Department of Science and Art. The public manifested a warm sympathy in the proceedings, and the hall was crowded. Mr. Arthur Malet, of Pyrland Hall, presided on the occasion, and in opening the proceedings observed that the audience would be happy to learn that there had been a satisfactory increase of pupils during the past season; and as to the quality of the work done and progress made by them, they could judge for themselves, on viewing the examples of skill around the room. It was contemplated shortly to extend the usefulness of the school, and to make it a school for science as well as art.

The Carlisle School of Art.—The annual meeting of subscribers to this school and distribution of prizes to students by the Mayor, has been held in the School-room, Mechanics' Hall, in this city. The Mayor presided. A large number of ladies were present. The secretary read the report, according to which:—

"The Committee have great satisfaction in stating that the school still continues to maintain a high standard of success; the work of the past year having placed it 16th on the list, there being 107 schools in the United Kingdom.

The following is the number of prizes and certificates of merit taken by the students during the year ending May, 1870:—

In the second grade examinations in freehand, geometry, perspective, and model drawing, five obtained prizes, and twenty-five certificates of merit.

In the third grade, which consists of drawings sent to the examiners in London, the works of eighty-four students were pronounced satisfactory, and eight obtained prizes.

In the national competition, which includes only the best works chosen from the third grade, and to which the Science and Art Department have only awarded eighty-six prizes to the whole of the schools in the kingdom, the committee are proud to state that a silver medal has been awarded to Ed. T. Parker, for an oil painting of a group of birds from nature; and also a Queen's prize to Thomas Palmer, for a drawing from the antique. The master, Mr. Lees, has also obtained a bonus of 20*l.* for success in the various examinations which have taken place during the year.

The committee can now congratulate you upon the removal from the old school to your present more desirable premises. The arrangements and fittings are everything that could be desired for the education of art students in all its branches."

The Bishop of Carlisle, who was present, addressed the meeting. He said, there could be no manner of doubt that, in regard to art teaching, we are somewhat behind some of our Continental neighbours. Now, he ventured to think that that was not a condition of things which we English people ought quietly and patiently to abide. It may be that there are certain things which some of the nations on the Continent can do that we cannot do; but, at all events, it ought to be shown very distinctly and very clearly that we cannot do them before we quietly sit down in despair, and allow these things to be done for us by our brethren on the other side of the water. He thought we ought to have the same kind of proper national pride as regards art that we have in regard to other matters. Who was there in that room who believed it possible that a Frenchman should ever beat an Englishman? There used to be a rhyme, none the worse, perhaps, for being a little rough and lame, that

> "One Frenchman can lick two 'Portugues,'
> And one Englishman can lick all three."

That was a very proper feeling for all Englishmen to have, and he had no doubt that every true-hearted English boy in the school would go in for the great truth that an Englishman can always beat a Frenchman or a German or anybody else. That is the view which we have always had; but at the present time a grumbling, pitiful spirit has taken possession of some Englishmen, and it seems that if any great Continental nation—if anything like a great Russian bear appears to be disposed to growl, we forthwith should say, "Oh, don't growl, don't show your teeth, and whatever you do, don't bite us!" Such a feeling as that is disgraceful. We ought all to be desirous of peace, but at the same time we should be confident in the strength which God has given to this great nation. If that be true with regard to questions of physical strength,—in regard to that which we all hold so dearly as to the hold which Britannia has of the waves,—we ought to be prepared to compete with, and, if possible, surpass the nations of the Continent in art as well as in other things. Well done, Bishop!

Northampton Museum Science and Art Classes. The annual distribution of prizes to successful students has taken place in the town-hall, Mr. W. Smyth, deputy-chairman of Quarter Sessions, having undertaken the work of distribution. The mayor presided. There was a large and appreciative audience. The eastern wall of the hall was adorned by drawings of the students of the art classes. Mr. J. B. Heneman then read the reports. Mr. Charles Lees, the science teacher, reports as follows:—

"The continued success of the science classes. The total number of entries for the winter 1869-70 was 115. Of these ninety offered themselves for examination in May last in the subjects of Animal Physiology, Mathematics, Acoustics, Light and Heat, Magnetism and Electricity, Inorganic Chemistry, and Physical Geography. Thirty-three passed in the first class, fifty-nine passed in the second class. To the thirty-three prizes were awarded. The most successful class was that in Chemistry. Twenty-four were examined in this subject; fourteen obtained first-class, and eight second,—a very satisfactory result, considering the difficulty of mastering the symbols and nomenclature which must be thoroughly done to obtain a pass. In my report for 1869 I mentioned the great difficulty under which we laboured in having small and inconvenient rooms. I am glad to be able to report that, through the liberality of the committee, and the earnest desire of the secretary for our success and welfare, we have now two excellent rooms, the larger one fitted up as a laboratory, with full sets of apparatus. Thirty students at one time can now be employed in practical analysis."

Mr. Abram S. Taylor reports as follows:—

"I have to place before you the third annual report of the progress and condition of the Northampton Museum Art Class since my last report, in which I stated a want of convenience in the class-rooms for the arrangement and lighting the casts. The classes have been removed to the new Grammar School, where class-rooms are more convenient and better adapted for the accommodation of students. The success of the students exceeds that of the two previous years of the existence of the class, and the number of prizes obtained in the second and third grades is greater than that of the two previous years added together. The attendance of the students is highly satisfactory, and maintains an average greater than that of last year. The number of students on the books at the present time is 56, 34 being males and 22 females.

The following is a list of the results of the late Government examinations. In freehand drawing, 15 students passed successfully, 5 of them gained the highest number of marks, and consequently prizes. In geometry, 10 passed successfully, and 6 of them gained the highest number of marks, and therefore prizes. In perspective, 7 students passed, and 3 gained the highest number of marks. In model drawing, or drawing from the round or solid objects, 14 were successful, 6 of whom gained the highest number of marks, and therefore prizes."

Mr. Smyth, Mr. Buckmaster, and Sir Henry L. Dryden, afterwards addressed the meeting.

DWELLINGS OF THE POOR.

SIR,—Many indiscreet persons, with imperfect information and knowledge of the subject, would apparently advocate indiscriminate demolition of the dwellings of the poor, which may not meet our conception of what their dwellings should be, wholly forgetting that such a course would infallibly lead to the greater evil of overcrowding, inasmuch as the railways have already reduced their dwellings to a minimum. These reformers begin at the wrong end. What is required is a *condition precedent*; viz., the erection of healthful lodging-houses and suitable dwellings for the poor,—a very great want indeed in this wealthy metropolis, and well worthy the attention of Government. R. L. S.

METROPOLITAN RAILWAY SITES COMPETITION.

SIR,—A short time since the directors of the Metropolitan Railway Company offered premiums for the best plans and suggestions for the utilisation of some of their surplus land. In response to this, a considerable number of drawings were sent in, and have been exhibited in four shops near the Praed-street Railway Station. These drawings are most interesting, not merely as showing the variety of modes of laying out the same piece of land, but also the different ways in which the same idea is worked out.

My object, however, in writing to you is to call your attention to the fearful waste of labour and money expended in the most useless manner. Many of the competitors, not content with sending in block plans, or even detailed plans, where the scale is too small to show their views sufficiently, have prepared the most elaborate elevations and highly coloured perspectives, as well as detailed plans of each floor, sections, &c., drawn to a large scale. It stands to reason that such drawings as these cannot be required; as, if the land is to be let for building, the tenant will prepare his own plans, and (it is hoped for the sake of the profession) elevations too; or, if supposing the directors take advantage of their power and build themselves, why should competing architects put themselves out of the way to supply drawings for which they were not asked, and which, judging from the liberality of their prizes, the directors, when so requiring, would gladly pay for.

When the public see the readiness with which architects entail upon themselves so much unnecessary labour in the risk of getting a premium of fifty guineas, can it be wondered at that clients should consider 2½ per cent. a large sum for the preparation of drawings, and insist on the drawings being delivered to them? When will architects see the suicidal course they are adopting? I say nothing against competition; but it is a great pity that work is given away when not asked for.

This competition will, I think, tend to remove some of the odium often cast upon surveyors at their difference of opinion as to the value of property when put in a witness-box. It is certain that the valuations which accompany some of the designs are thoroughly conscientious, but the figures vary considerably. Taking the Smithfield estate as an instance, the values vary from one shilling to five shillings a superficial foot, whereas some land in close proximity belonging to the Corporation was offered by public auction, about a fortnight since, and a portion sold at the rate of about 1*s.* 4*d.* a foot. J. D. M.

RE THE KING'S CROSS INDUSTRIAL DWELLINGS COMPANY (LIMITED).

THIS was a creditor's petition in the Equity Courts for the winding up of the company. The petitioners were advertising agents, and their claim was 75*l.* for advertisements inserted in newspapers by direction of Mr. Barrett, the honorary secretary. The company was formed in May last for the purpose of providing decent and comfortable dwellings for the poor, and arrangements were made for the purchase of a site at King's-cross. The capital was to consist of 23,000 shares of 2*l.* each, of which the gentlemen who signed the articles of association agreed to take 460, but nothing had been paid in respect of shares, and the erection of the building had not been commenced. On the part of the company it was submitted that Mr. Barnett was personally liable for the debt under an agreement by which he was to receive 1,000*l.*, and bear all the preliminary expenses. The Vice-Chancellor was of opinion that there was no substantial ground for questioning the debt, and therefore he should make the usual order; but he would direct that it should not be acted upon for a fortnight.

WOODEN BUILDINGS.

SIR,—Will you oblige a constant subscriber, and aid me in removing the present nuisance that exists in the erection of the *wooden post*-houses in front of the shops of the Lower Wandsworth-road. Built in a public place like this, under the nose of the district surveyor, I cannot help wondering that it should be allowed. Y.

THE STRENGTH OF SLATE.

SIR,—Can any of your correspondents give me any information (through the medium of the *Builder*) respecting the strength of slate slab? I want to know what weight a slab of the following dimensions will carry, viz., a circular slab 2 in. thick and 6 ft. diameter, with a circular hole 1 ft. 3 in. diameter cut through the centre. The slab to have a 3 in. bearing round the outer edge, leaving a clear space of 5 ft. 6 in. diameter. A MASON.

PAINT FOR POROUS STONE.

SIR,—Can any of your readers kindly inform me in your next issue which is the best and most durable kind of black plaint, and the ingredients used in it, for painting letters in porous stone, such as Pennant or Portland; and, if the paint is made in oil, is there any method adopted to prevent the oil from soaking out at the side of the latter? J. M.

PAINT ON STONE.

SIR,—Will you allow me to ask whether any of your readers know of any method by which paint can be removed from a font, &c., executed in Caen stone; and whether any one who has tried the experiment has found it answer; and what the cost is? N.

*** A similar question has been inserted before now, but brought no satisfactory reply.

SUGGESTIONS FOR LISMORE CIRCUS.

SIR,—I cannot but think that the Metropolitan Board of Works are not exhibiting much taste in laying out Lismore Circus, which lies between Haverstock-hill and Kentish Town. The plot is about 100 yards in diameter, to judge by the eye; and, if I understand aright, the Board are reducing the space by constructing a 5 ft. or 6 ft. path outside the future fence, thereby materially diminishing the area, and affording no convenience to the public, as observation in other localities will show. Then, instead of carting away the superfluous soil, the more economical plan has been adopted of making it into a central mound, some 8 ft. high, and about 100 ft. in diameter, and this mound is apparently to be encircled by a gravel walk of some 10 ft. or 12 ft. in width, thereby reducing the promenade to a minimum instead of a maximum, by carrying it round the full circumference of the circle. No doubt the central mound will look very pretty when stocked with rhododendrons and other flowering shrubs, but surely it is against one of the first principles of art to make a thing appear smaller than it is, and such must be the effect of the mound in question. Is it, I ask, too late to have it removed? The cost would not be, I should say, great, as more than one railway has land in the immediate neighbourhood already covered with excavated materials; or if this cannot be done, the mound might be converted into four banks, one opposite to each of the entrance-gates.

Having now criticised the plan of the Board, I offer my own for their consideration. I would at once do away with the projected external footpath, and bring the outer fence to the inner edge of the present curb-stones, which would be a sufficient protection against passing wheels, &c. Inside the iron railing, I would plant a hedge, not of thorn or privet, but yew. The two former shrubs make a very ragged fence unless trimmed pyramidically, and that requires a very broad base; but a yew hedge can be grown wall-sided, and need not be more than 2 ft. thick, consequently space is again saved. This yew hedge might be kept about 7 ft. high, save in three or four places, where bowers might be ultimately grown. Inside this 2 ft. of hedge, I would have 3 ft. of border planted with about twenty lime-trees, and between the intervals flowers might be grown as long as the trees will allow them to flourish. Then I would construct a promenade gravel walk of 12 ft. or 15 ft. wide, with an inner row of lime-trees occupying the intervals of the outer row. The centre might have some half a dozen scattered thorns, horse chestnut, and plane trees; but I would have no beds of shrubs or flowers save at the entrance-gates, but keep the centre for a turf promenade. AN AMATEUR GARDENER.

NEW WORKS.

IRISH PRIVATE BILLS IN PARLIAMENT.

LAST week we mentioned some of the English metropolitan Bills in Parliament Session for 1871. The following are the Irish metropolitan and provincial Bills:—"Dublin Main Drainage;" "Belfast Drainage and Improvement;" "Dublin Tramways; "Dublin, Wicklow, and Wexford Railway;" "Great Southern and Western and Cork and South Limerick Direct;" "Great Southern and Western, No. 1; Great Southern and Western, No. 2;" "Northern and Western of Ireland;" "Waterford and Wexford, Whitehaven and Wexford, Steamboats Bill;" "Waterford, New Ross, and Wexford Junction;" "Waterford and Central and Kilkenny Junction;" Ennis and West Clare Railway."

Considering the insolvent state of many of the Irish railway lines, these intended extensions create a surprise, and we should not wonder hereafter to hear of the companies asking Parliament for powers to abandon them. Nothing, as far as we can see at present, will save many of the Irish lines from annihilation except their purchase by Government; and there is a strong party in the sister kingdom at present who have been energetically working for years to accomplish that end.

THE "STREET-ORDERLY BIN."

AN invention under the above name has been adopted by the authorities for use in the streets of the City of London, and has attracted considerable attention amongst passengers along the Holborn Viaduct and the more frequented thoroughfares, particularly those in which the new asphalte pavement has been laid down. Owing to the impossibility of keeping the main streets clean by means of the ordinary night sweeping, a staff of boys was engaged to keep constantly at work with hand-brush, shovel, and basket, throughout the day, each boy having a section of the street allotted to him. This was proposed several years ago, and called the "Street-orderly System." It soon appeared, however, that the dirt accumulated by each boy was a great obstruction and a nuisance on the edge of the road, and the expense of men and carts constantly going round to collect it was very great.

To meet this objection the street-orderly bin was introduced by Messrs. Burton, Sons, & Waller, the manufacturers of sanitary ironwork, of Holland-street, Blackfriars. It consists of an upright box, a little too like a pillar letter-box, with a sliding lid at top, which opens to receive the contents of each shovel, and a sliding door at bottom, by which the bin is emptied at night by the regular scavengers' carts.

Where space in the street is very scanty, the bin can be made as the base of a lamp-post, and it is particularly adapted for use as a public dust-bin, in narrow courts, where it can be recessed into the wall, so as to avoid obstruction.

"THE WANT OF ARCHITECTURAL INSTRUCTION IN MANCHESTER."

I WOULD refer the writer of the letter which appeared with the above heading in your last issue, to the prospectus recently issued by the Manchester Society of Architects, and of which copies were sent to all the known architects in this city, for distribution amongst their pupils and assistants. You will see by the copy I enclose that the object has been to bring prominently under their notice that there are excellent aids to the study of their profession within the reach of all who choose to avail themselves of them, in the classes at Owen's College, the School of Art, &c., and in the magnificent collection of books at the Free Library, which contains a large proportion of those recommended by this society for study, and also that there are several valuable prizes open to them to compete for.

If the writer of the letter referred to had been even but a short time in Manchester, he would, I think, have known that attempts of the kind desired by him have been made by a kindred society, the Manchester Architectural Association, and that, notwithstanding the strenuous and laudable exertions of those who have given both time and money, the result has been a total failure.

It cannot be wondered at, therefore, if the members of the Society of Architects, old practitioners most of them, should hesitate at giving their time, and the results of their experience, in repeating an experiment apparently so unpromising.

J. MURGATROYD,
Hon. Sec., Manchester Society of Architects.

THE BLOCK BOOKS.

I SCARCELY believe many of your readers will approve the theory of "F. S. A.," that where a distinct declaration, purporting to represent a fact, has been made by A, and its truth denied by B, "the burthen of the proof rests with B." On the contrary, I venture to submit that in such a case the affirmative of the issue is clearly a duty legitimately and properly cast upon A; and under that belief, I (for the present, at least) decline stating my reasons for rejecting the imaginary antiquity of the "Biblia Pauperum," but require the authors of the statements I have called in question to prove their correctness.

In this stage of the controversy I see no utility in "F. S. A." referring to the letters of Mr. Noel Humphreys and of Monsieur Berjeau, unless at the same time he mentioned my communication which led to the first, and my answer to the second, both of which must be perfectly well known to "F. S. A."

If the date impressed on the hogskin binding in Lord Spencer's copy of the "Biblia" had been 467, instead of 1467, it would have been equally as material in relation to the truth. If your next impression should leave my challenge unanswered, I will supplement it with a list of queries, upon the satisfactory solution of which the question I have raised will mainly depend.

HENRY F. HOLT.

MEMBERS OF THE INSTITUTE AND BUILDERS.

SIR,—Your correspondent "E.," in your number of the 3rd inst., p. 971, states that it is no secret that in the provinces it is a *common* thing for Fellows of the Institute to take out their own quantities, and in some instances to receive payment from the builders without their clients' knowledge, and to charge 2½ per cent. instead of 1½ per cent. charged by competent surveyors; and that such men, too, are not above taking commission also from contractors and tradesmen; and he adds, "of what use is it to make rules that members are *not* to do such things, and wink at their being done?"

If, sir, your correspondent "E.," instead of making sweeping accusations, direct or by innuendo, will furnish me with the name of such a Fellow, and state the occasion, and furnish me with positive evidence of the fact, with his signature attached, I undertake to bring the matter under notice of the Council, who, as high-minded and honourable men, will, I am sure, not blink such a question, but bring it to a practical issue.

THOS. L. DONALDSON,
Hon. Sec. Foreign Correspondence.

TO FRANCE.

BRAVE LAND! yet longer bear Fate's hard control!
Men said, and truly, Pleasure and wild Joy
Were all thy worship, and that each vain toy
Absorb'd thy frivolous heart; nor could thy soul
Uplift itself from idlest mirth and glee.
Now, Paris, rise, and show what thou canst be!
How Pestilence can be borne—how trial met—
How Famine wakes nor murmur nor regret.
What though the leaguer sits before thy walls,—
What though thou echo'st back his trumpet-calls,—
What though, to celebrate some festive day,
He bids the triumphs of thy Science play,—
Be thine firm Order,—Patience 'neath the doom,
Nor let foul Anarchy thy fame o'ercast;
But thus, devoted to a living tomb,
Win thou from Heaven dear recompense at last.

M. Y. F.

A NEW SCHOOL FOR BRIGHTSIDE, SHEFFIELD.

A MEETING of the workmen of the Atlas Works has been held for the purpose of taking steps to assist in the erection of schools in connexion with All Saints' Church. The cost of the schools, which it is intended shall accommodate upwards of 1,200 children, will be between 4,000*l.* and 5,000*l.* The land upon which they will be erected is near the church, and the whole of it, valued at 800*l.*, has been generously given by Sir John Brown. In addition to this sum, Sir John will contribute 500*l.* towards the erection. The want of school accommodation in that part of the town has been long felt. The schools which have hitherto been used are in the Atlas Works, and on Sundays they are so crowded that some additional rooms have had to be taken. But even now sufficient accommodation cannot be obtained. In the proposed new schools, there will not only be large schoolrooms for children, but class-rooms for young men, and rooms in which meetings of working men can be held. The meeting on Saturday took place in the boiler-plate department. It was well attended, there being probably upwards of 1,000 persons present. Mr. J. D. Ellis said it was unnecessary for him to explain the object of that meeting. They were probably all aware that an Act of Parliament had recently been passed, which made it necessary that any schools which were to be erected to be independent of the Act should be commenced immediately, and that a portion of the funds required should be raised before the end of the year. That was the reason why it had been thought necessary to call them together at that time. It was quite advisable that they should make great exertions if they were to have schools in that district which would be independent of the Education Act. What they wanted the men to do was to set about getting funds for the building of schools near All Saints' Church, and upon land which Sir John Brown was prepared to give. If they did not get funds and commence the buildings before the 1st of January, they would lose the large subscriptions which had been promised towards them, and probably Sir John would withdraw his offer of the splendid piece of land. Sir John Brown and other gentlemen addressed the meeting, and resolutions promotive of the object of the meeting were passed.

HALIFAX BUILDING SOCIETY'S OFFICES COMPETITION.

SIR,—I believe with your correspondent, "A Competitor," that if official information be waited for, at least forty-six competitors may be kept in suspense for an indefinite period. I will, therefore, with your permission, give some particulars which have come to my knowledge.

The chance of carrying out the work *on terms to be hereafter agreed upon*, of gaining a premium of 30*l.*, and one of 20*l.*, were the baits offered to architects, one of the conditions being that no award would be made unless the directors were *satisfied* that the designs could be carried out for the stipulated sum of 5,000*l.*

It was not likely that the gentlemen who were so very shrewd as to secure such a saving clause would be easily *satisfied*, for, according to the wording of the clause, it would not be sufficient for the authors of the designs to *prove* that they could be so carried out.

However, forty-nine architects submitted designs, no doubt expecting fair play, and three were selected for trial, the first in order being by Mr. Hagen, of Hull; the second by Mr. Bailey, of Keighley; and the third by Mr. Jackson, of Bradford.

In reply to inquiries made in your columns, the secretary to the society stated that the first (Mr. Hagen) had failed to give the required satisfaction, and that the second was then on his trial. I am not aware that any further official communication has been made, but I am in a position to state that Mr. Bailey also failed, and that Mr. Jackson was more successful, or, at all events, he is commissioned to carry out the work.

Immediately after Mr. Jackson was appointed architect of the building, it was decided to *modify* his design, and the 30*l.* premium was offered to Mr. Bailey, whom the directors had, by a former resolution *excluded from the competition*; the premium was accepted, and the drawings consequently forfeited.

I am only posted up in this matter to September 6th (three days after Mr. Bailey received the offer of the premium). On that day the forfeited drawings were sent from the society's office to Mr. Jackson, and the remainder were then at Halifax.

Perhaps Mr. Hagen will say whether he has received the 20*l.* premium.

The fact that one of the directors is an architect, and that some of his colleagues are men whose reputation for probity is not confined to Halifax, does not lessen the strangeness of their proceedings.

ANOTHER COMPETITOR.

*** The secretary informs us that a circular has now been sent to each competitor, stating that

he directors have selected the first design, and lso awarded the premiums to the competitors, econd and third in order of merit, with the ollowing result :—

1. "Prosper the Society," Mr. Samuel Jackson, architect, Bradford.
2. "Architectus," Mr. Wilson Bailey, architect, Leeds and Keighley.
3. "Selon Mérite," Mr. J. T. Meredith, architect, Kiddermiester.

"Considerable time has been taken up in enabling the directors to decide upon their award; but this has been unavoidable, from the necessity, in their judgment, of testing, by estimates obtained from responsible contractors, whether the design selected as the first in order of merit could be carried out for the amount stipulated, viz., 5,000*l*. Two sets of designs had to be rejected from their inability to stand this test.

To show that great care has been exercised by the directors in keeping strictly to the terms of the circular issued to the competing architects, they deem it right to themselves to state that contracts have been already entered into for carrying out the selected design in the following departments of works, viz.—Mason and excavator, joiner, plasterer and slater, plumber, and heating apparatus, for a sum considerably below the stipulated amount."

CHURCH-BUILDING NEWS.

Little Dewchurch.—The church of this parish, dedicated to St. David, has been re-opened for public worship, after undergoing a restoration or re-building: except the tower, it has, in fact, been entirely pulled down and re-built. The walls of the original church had no foundations, but the present building has; and the nave, which was originally disfigured by pews and a low ceiling, has been improved by the restoration of the old benches, most of which, after undergoing repairs, were used again. The timbers of the old roof, which were previously hidden from view by the low plastered ceiling, are now opened out, and the chancel arch, which was also very low, and was fast becoming dangerous, has given place to one of greater elevation in the Pointed style. The chancel is fitted with stalls, and a three-light stained glass window has been inserted from the architect's own design. A reredos, the centre of which consists of alabaster, inlaid with Venetian mosaics, represents in the centre the Agnus Dei, and on each side angels bearing harps; the reredos is extended to the north and south walls, with paintings on zinc. The whole church is floored with encaustic tiles, from the celebrated Lugwardine works. The tower has been restored and strengthened, and the peal of bells, which originally consisted of three only—one of which had been broken for many years, and has now been recast by Messrs. Taylor, of Loughborough—has had two bells added, making a peal of five. The whole work has been carried out under the superintendence of Mr. J. Preedy, of London, at a cost of 1,400*l*., which sum includes not only the church restoration expenses, but the building also of a new boundary-wall round one side of the churchyard, the repair of all old walls, drainage—including large culvert drain,—new gates, and various other items of expense necessary to make the work complete. As far as possible, the materials of the old building have been used up,—as in the working in of the old windows, &c. The new church stands pretty nearly, if not almost entirely, on the site of the old one. The work of re-building has been carried out by Mr. Mayman, of Belmont. The church is furnished with heating-apparatus.

Heigham.—The division of the extensive and increasingly-populated district of Heigham into three parishes has been followed by efforts for the provision of more adequate church accommodation. In the parish of Holy Trinity there has for some time been a large and commodious church; and a short time since the more recent parish of St. Philip was provided with a structure used for divine worship until the church itself, which is in course of erection, is completed. Greater church accommodation has now been also provided for the district included in the parish of St. Bartholomew. A "temporary church," capable of seating 500 persons, has been put up. It stands on land abutting upon Adelaide-street, where the principal entrance is; but there is also a second entrance from Old Palace-road. Although designated a "temporary" church, the building has an appearance of substantiality. It is 75 ft. 6 in. long, and 33 ft. wide, with open benches for 500 persons. In the front is a porch, 20 ft. by 5 ft., and at the rear a large room for vestry and other purposes, 33 ft. by 12 ft. The building, which is constructed entirely of timber, the sides being strongly framed, and on the outside covered with stucco, is plastered on the inside to within 4 ft. of the floor, and the walls are lined for that depth with boarding. The roof is lofty. It is constructed in six bays, open to the ridge, which is 30 ft. from the floor. The ribs consist of boards blocked out and bolted together, and covered on each face with radiating boarding, forming a semicircular arch, springing from about 5 ft., and reaching the height of 21 ft. from the floor. There are no rafters to the roof, which is covered with boarding laid upon purlins; and the whole of the boarding, timbers, and framing are stained and varnished. There are no windows in the sides of the church; but light is obtained chiefly from a lantern running the whole length of four bays of the roof. The centre sashes in each bay are opened by lines and pulleys, connected with a rod extending along the lantern, and working on centres, a line with a small wheel at one end opening and shutting the whole of the lights. There are also windows, with trefoiled heads, in each gable. At night the church is lighted by means of twelve star burners, of ten lights each. The floor is formed of thick boards, laid without joists, upon timbers placed 6 ft. apart, and is suitably covered with matting. The benches are made of deal, with light wrought-iron bearers, for supports, screwed to the floor, and have sloping backs, with a book-board affixed under the seat. The work has been carried out, at a cost of over 600*l*., by Mr. James Youngs and Messrs. Wilkins & Curtis, from plans prepared by Mr. Henry Hall, architect, London.

Thornby.—The parish church of St. Helen, Thornby, will be re-opened for divine service after a thorough restoration and enlargement. The expense attending the work has been considerable, and, at the present time there is a deficiency in the amount required of 250*l*. The church was very small and altogether inadequate to the wants of the parish. It consisted of a small nave and chancel, with a tower at the west end, and was in a dilapidated condition. The windows, which, for the most part, are Late Square-headed Decorated, have been preserved and restored. The greater part of the chancel was in too wretched a condition to be preserved, and has been partially rebuilt, and a new decorated window, at the east end, now takes the place of an opening, with an arched head and wooden mullion in the centre, which was not worthy the name of a window. The whole of the church has been restored, and conservative feeling has been exercised throughout. A small lancet window was discovered on the north side of the church, and this has been reinserted in its original position. The tower arch which, like many others, was blocked up and lost to the church, has been opened and restored. In order to provide proper accommodation for the parish a new aisle has been erected on the north side, with windows of Early Decorated character. It is built of Duston stone, with Bath ground stone dressings to windows, and Duston hard stone parapets, copings, buttresses, weatherings, &c. The arcade of the new aisle is executed in Bath stone for the most part, but the arches are in Duston and Bath stone alternating, as are also some of the relieving arches over the windows. The roofs are new throughout, including the porch, and of the best pitch pine. The main timbers are stained and varnished, but the boarding is left in plain wood, without varnish, first, in order to produce a pleasing contrast in colour; and, secondly, to prevent the dropping of wet in the winter season, which is so often the case in consequence of the condensation of moisture. The floors of the church and chancel, up to the sanctuary, are paved with Maw & Company's best black and buff tiles, in different designs, and the parts within the sanctuary and on the foot pace are laid with ornamental encaustic tiles from the same firm, of simple designs. The whole of the seats, including the choir stalls, are of pitch pine, with solid ends, having carved paterns on the outside, suited to the form of the ends. Besides the new aisle, an organ-chamber and sacristy have been erected on the north side of the chancel, with an arch opening into the chancel, and another at the east end of the new aisle. The lower or first side of these arches is supported by corbels carved in natural foliage, slightly conventionalised. The tower arch and the vestry have each a screen of Early Decorated character. The works have been carried out from designs, and under the superintendence, of Messrs. E. F. Law & Sons, of Northampton, architects, and executed by Mr. Gee, of Daventry, builder.

Garston (Liverpool).—The foundation-stone of a church, to be dedicated to St. Matthew and St. James, has been laid at Mossley-hill, Garston. The edifice, according to our authority the local *Journal*, is to be erected and endowed out of the funds left by the will of the late Mr. Matthew James Glenton. Ultimately those funds will realise about 40,000*l*., and it is intended hereafter to erect a parsonage and schoolrooms close to the church. The work has been delayed for some time owing to the opposition which the trustees,—Messrs. G. M. Bowen and P. Vance,—encountered from the incumbent of an adjoining township, who maintained that further church accommodation was not required in that neighbourhood. It was, however, the particular desire of Mr. Glenton that the church should be erected on Mossley-hill, and the trustees therefore selected the site in question. The church is designed in the early geometrical style, of the thirteenth century. A site has been selected, commanding views of the Allerton and Mersey valleys, and being about a quarter of a mile to the west of the Mossley-hill railway station. The stone of which the walls will be built is being obtained on the site, from a quarry opened for the purpose, bands of lighter coloured stone being introduced to both inside and outside to lighten the somewhat sombre effect of the red stone. The dressings of the arches, windows, &c., are being obtained from the Woolton quarries. The ground-plan consists of a nave, 97 ft. 6 in. long, by 24 ft. 6 in. wide, and lighted by a clearstory of twelve two-light windows on each side, and a west window of five lights; the north and south aisles, 97 ft. 6 in. long, and 13 ft. wide; chancel, 48 ft. 6 in. by 24 ft. 6 in. wide, with a tower, 30 ft. square, placed across its western end, and having arches on the north and south opening into the quasi-transepts, which are used for the vestry and organ, with clearstory above to admit light for the choir, which is placed under the tower. The heights of the building are 40 ft. from the floor to the wall-plate of the nave and chancel, and 64 ft. to the ridge; the tower being 114 ft. from the floor to the top of the parapet, and 142 ft. to the apex of its roof. The entrances are by a large western door, and by a porch in the western bay of the north side. The roofs are to be of pitch-pine, unvarnished, as are also the seats, which will accommodate 800 adults. The font is to be adjoining the west door. The cost of the church and fittings, exclusive of the organ, will be 10,000*l*.; the parsonage, which is to be placed at the south-east angle of the site, being estimated at 2,000*l*. The architects are Messrs. Paley & Austin, Lancaster; and the builder, Mr. William Winnard, jun., of Wigan.

Carlisle.—The new church of St. Paul, in this city, has been consecrated. The edifice has been erected at a cost of about 3,700*l*. The original estimate was 2,930*l*.; but some additional work, which was the subject of extra contracts, has been executed, including some little progress with the tower, which, together with a spire, it is proposed to add to the church when the funds allow. The edifice, which has been built from the designs of Messrs. E. Habershon & Brock, architects, stands in an open space of ground, bounded on the east by Spencer-street, on the north by Lonsdale-street, and on the west and south sides by two new roads. It is built, in the Gothic style of architecture, of Newbiggen red stone, with high-pitched roofs, covered with green slates, the windows being of different patterns of geometrical tracery. Within, the church consists of a nave, nearly 30 ft. wide, and 73 ft. 3 in. long, with north and south aisles, divided from the nave on each side by five Gothic arches, of alternate red and white stone, supported by circular columns. The nave is heightened by a clearstory above the arches, containing a series of circular windows and tracery. The chancel is 20 ft. 10 in. deep, and is spanned by an arch extending over its entire width, the walls up to a certain height being painted, so as to represent a wainscoting of coloured tiles. The whole of the roofs are of open timber work. The west front, which looks towards Lowther-street, has a large Gothic window, of rich tracery, but with rather stunted mullions. The windows are filled with cathedral glass, of a green shade, and its colour gives a cold appearance to the interior which might, with advantage, have been relieved. The seats are open benches, and, what is a useful feature of church fittings, have small umbrella-racks at the end. There are two entrances, besides one from the vestry,—one at the north-east angle, where the tower and spire are proposed to be erected, and the other beneath the west window. Sittings are provided for 600 persons. At present

the absence of the tower and spire prevents the fabric presenting an imposing appearance. Those adjuncts it is proposed to run up to an altitude of 120 ft. As designed, the tower will have angle buttresses and four pinnacles above which will be the belfry windows, in an octagonal story, and above which will rise the spire, with high open pinnacles over the spire lights, in addition to the larger ones below. The organ was purchased by special subscription, at a cost of 285*l.*, towards which Mr. Losh, of Manchester, gave 200*l.*, and Mr. Charles Armstrong 50*l.* The contractors for the building and joiners and carpenters' work were Messrs. Charles & John Armstrong, of Carlisle, and the minor contracts were also carried out by Carlisle tradesmen,—the slating, by Mr. James Graham; the plastering, by Mr. Ormerod; the painting and glazing, by Mr. Canning; the plumbing and gasfitting, by Mr. Willoughby. The iron palisading surrounding the church was supplied by Messrs. Porter, Hinde, & Porter; and the heating apparatus, which consists of hot-water pipes, was laid by Messrs. Lees & Graham. The whole of the chancel furniture is from the workshops of Messrs. Kirkbride & Son, and the decorations of the chancel wall and the inscription upon the pulpit were executed by Messrs. John Scott & Son.

St. Mary-at-the-Walls.—An effort is about to be made to thoroughly restore and re-arrange the sitting accommodation of, and to build a chancel to, the parish church of St. Mary-at-the-Walls. The church committee, recently appointed by the parish, at its first meeting unanimously determined to call in the professional services of Mr. Arthur Blomfield, architect, son of a former Bishop of London and Archdeacon of Colchester, to survey the building and report upon the best means of increasing the efficiency of the accommodation.

Llanvetherine.—The parish church of Llanvetherine, in the county of Monmouth, has been re-opened after restoration. The roof, which was in a very dilapidated state, has been repaired, the old stone tiles removed, the defective timber taken out, and re-covered with slates and a Bath stone ridge, and the gables recoped with new stone. The interior of the roof, which is a wagon panelled one, has been carefully restored also. The decayed oak braces and ribs have been cut out and new ones inserted, the panels filled in with new V-jointed boarding, with moulded cornices. A new three-light window has been inserted on the north side of the nave, and the other windows restored and reglazed throughout. The defective parts of the walls have been restored with new masonry, and the inside plastered. A new panelled ceiling has been placed in the tower, with a new open termination, in pitch-pine, to the tower screen. The old shaft and bowl of the font have been removed, and new substituted. A new pitch-pine seat has been fixed in the south-east corner of the church. The warming is effected by one of Gurney's stoves. The total cost of the work is about 400*l.*, the whole of which has been defrayed by the rector, the Rev. F. C. Steele. The works have been carried out by Mr. William White, contractor, of Abergavenny.

Biggleswade.—The ancient parish church of Biggleswade, Beds., dedicated to St. Andrew, has been re-opened, after extensive reparation. The structure is in the Early English style, with square tower and five bells, nave, chancel, and two aisles. There are sedilia on the south side of the chancel, with piscina in a more elevated position. The old church has features of great interest for antiquaries. In regard to the work of reparation, the original plastering, both externally and internally, has been removed, and the interior pointed with light mortar. The outside parapet, walls, and other brickwork parts have been rebuilt in sandstone, to match the other parts of the building, with new stone string-courses and battlements. The tower, which is built of clunch, has been cleaned down and pointed, and new battlement coping put on; and the ringers' chamber, formerly ascended to by means of a ladder, is now reached by a new spiral staircase, built on the north side. The turret clock has also been renovated, the face having been newly gilded, and new works added to the inside. The square pews of the church and chancel have been replaced by new open benches, those in the nave having square ends, with sunken panelled tracery, and those in the chancel carved poppy-heads, all of pitch-pine. The western gallery and ringing-chamber, which formerly hid the tower arch, have been taken down, and children's seats on a raised platform occupy the space. The side galleries, however, which cover the whole of both aisles, still remain. A new organ-chamber has been built on the north side of the chancel, with cellar for the heating-apparatus beneath. Nearly the whole of the stonework, which was very much decayed, has been restored; and where so much of it had been mended with cement, it has been cut away and replaced with new stone. A noticeable feature was the new carved stone pulpit. The work is estimated to cost about 2,000*l.*, exclusive of the organ-chamber, which cost about 160*l.* The stone pulpit and the whole of the stonework was done by Mr. William Wade, of St. Neot's; the wood-work by Mr. Thomas Edey, of St. Neot's; the tile floors were supplied by Messrs. Maw & Co. The architects were Messrs. Habershon & Pite.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Bow.—A new church has been opened at Bow. The edifice stands opposite the Protestant Church. It is of Kentish rag stone, and the style is Gothic. The building is of considerable size. Mr. Blount was the architect.

DISSENTING CHURCH BUILDING NEWS.

Sheffield.—Broompark Congregational Church has been re-opened. The edifice has been built by two instalments. Some seven years ago the nave was roughly put up as a temporary beginning to a more commodious structure, the transept and ornamental finish being left to some future occasion. That occasion arose when, the Rev. Professor Tyte having accepted the pastorate, Messrs. Innocent & Brown, the architects, were requested to submit completed plans. Their designs have now been carried out, with the exception of a porch and spire in front. It is only fair to the architects to state that these have been omitted, as the criticism to which the exterior of the building is still open might have been disarmed had the full scope of their plans been executed. The effect of the interior is very simple. The church is in the Early Gothic style. The new portions comprise transepts, two vestries, and apse; underneath being a lecture-room for week-night services, which will accommodate 250 persons; with entrance-lobby, vault for warming-apparatus, and other requisites. The building is lighted by coupled lancet windows, with large rose-windows in the transept gables, and smaller ones in the apse, filled with geometrical stained glass. Seats are provided for 450 persons in open pews, 3 ft. wide, of deal, stained, and having crimson cushions throughout. The pulpit and its accessories are of carved wood, by Mr. A. Hayball, from the architect's designs. Messrs. B. & T. Nelson were the contractors for the entire works, which have been carried out under the direction of the architects. The total cost of the completion is estimated at from 2,250*l.* to 2,300*l.* and of this 1,916*l.* have been raised.

Liverpool.—A new Wesleyan Chapel, which has been erected in Rowson-street, New Brighton, has been opened for public worship. The building has progressed with great rapidity, so as to be opened for public worship in about seven months from the commencement. The architect of the new chapel was Mr. Henry H. Vale, president of the Liverpool Architectural Society, whose designs were selected in competition, and have been carried out by Messrs. J. & T. Mason, of Egremont, builders; the sub-contractors for the joiners' and carpenters' work being Mr. Reddy of Liscard; for the plumbing, glazing, and staining, Messrs. Cherry & Lawlor, of Little Brighton. The reredos and pulpit were executed by Mr. Rogerson, of Liverpool, who also executed the whole of the carving.

Hull.—The Primitive Methodist Connexion have commenced the building of a chapel and schools in Lincoln-street, Hull. On the ground floor will be a large school and infant school, with six class-rooms, and above these will be a chapel to accommodate 670 persons, and capable of having erected at some future time a gallery to hold 120. The cost of the building is to be about 2,500*l.* It will be in the Gothic style of architecture, and of red brick with Ancaster stone dressings. Mr. S. Musgrave is the architect, and Mr. George Robinson the builder. Five foundation stones of the building were laid by members of the family of the late Mr. Samuel Hodge, to whose memory the building is dedicated. Several bricks also were laid. The layers of the stones each gave 20*l.* towards the cost of the building, which with the amounts subscribed by the "brick-layers," and money already raised, represents about one-third of the entire cost.

SCHOOL-BUILDING NEWS.

Scarborough.—The corner-stone of a new school building at Scarborough, to be called the St. Martin's Grammar School, has been laid. A site having been presented by Dr. Cross and Mr. Petch, of Scarborough, together with the sum of 1,000*l.* by Miss Mary Craven, the work will now be soon completed. The site fronts Ramshill-road, and the building, which is in the Gothic style, comprises school-rooms and class-rooms for boys and girls, and a large lecture-hall above. Mr. G. F. Bodley, of London, is the architect; and Mr. Thomas Petch, of Scarborough, is the contractor.

York Town.—The new National Church Schools, for York Town and Cambridge Town, Frimley, have been opened by the Bishop of Winchester. The schools, which contain every accommodation for the purpose, were designed by Mr. Buckeridge, architect, and built by Messrs. Collier & Catchpool, of York Town.

Barbourne.—A meeting of the parishioners of St. George's, Barbourne, was held in the vestry of the church, on Wednesday, for the purpose of considering what steps it would be necessary for them to take in the parish to meet the requirements of the new Education Act. The attendance was small. The following resolution was adopted:—"That the existing schools of the parish of St. George being inadequate to meet the requirements of the new Education Act, and so constructed and so inconveniently placed as not to admit of suitable adaptation to the wants of the parish, it is most desirable that new schools should be built for boys, girls, and infants, in lieu of the existing schools, on a more eligible site, and that a subscription be now opened for that purpose." The meeting appointed a committee for carrying out the resolution.

Hardwick.—A new school for the children of the parish has been opened. It has been built at the sole cost of Mr. Edward Thornton and other members of the family, the materials being carted by the farmers of the parish. The school is built of rock-work faced stone, with Mears Ashby stone dressings to the windows and doors. The roof inside is an open roof, with circled ribs to principals resting on stone corbels. The timbers are stained and varnished. At the east end of the school is a bell-gable, terminating with an iron cross. The school is lined with best dressed bricks, of different colours, and arranged with arches, and two recesses, with doors, which are intended for a school library. The school floor is laid with blocks of wood. Attached to the school are two cottages, for schoolmistress, &c. The school and cottages stand on high ground, rising from the street, near the church. They have been built from the plans and under the superintendence of Messrs. Law & Sons. The contractors were Mr. Banks and Mr. Keightley, of Northampton.

STAINED GLASS.

Sedgley Church.—Shortly after the death of the late Rev. W. Lewis, the inhabitants held a meeting, and then determined to perpetuate his memory by placing a stained window in the parish church, where he had ministered for nearly forty years. The window has just been inserted in the south aisle, as close as possible to the place of his interment. The window, which is in two divisions, illustrates the subjects of Christ feeding the multitude, and of little children being taken into the arms of the Saviour. The memorial was manufactured by Messrs. Hardman.

Little Milton Church.—On the death of Mr. E. L. Franklin, of Ascott, in August of last year, it was felt by some of his friends that it would be a gratification to them to erect some memorial in testimony of the high esteem in which they held his character. The parish of Little Milton owes very much of its temporal well-being to him, and as he took an active part in the building of the church, and was afterwards for some time churchwarden, it was thought that a painted window in the church at Little Milton would be a very fitting form of memorial. Consequently a subscription was started among some of Mr. Franklin's friends,

and a west window, by Messrs. Hardman & Co., of Birmingham, has been inserted.

St. Nicolas's, Beaudesert (*Warwickshire*).—In this church the two-light Decorated south window in the chancel has been filled with stained glass, by Wailes, under the direction of Mr. Hugall, architect, as a memorial of the late George Fayrer, M.D., of the adjoining parish of Henley-in-Arden. The subjects selected are, first, an illustration of the text,—"I was sick and ye visited me;" a male figure is bringing medicine to the bed-ridden, and in his left hand is a book with reference to the spiritual consolation, which, as a member of the medical profession, he was privileged to give. The second illustration is of the words,—"I was hungry, and ye gave me meat; I was thirsty, and ye gave me drink." The same male figure is seen relieving the wants of the poor. In the quatrefoil above there is an angel with a scroll, bearing the words,—"Ye have done it unto me." Mrs. Phillipps, an aunt of the late Dr. Fayrer, who was highly esteemed by his fellow-townsmen, has made this offering; and we hope others may be induced to follow the example in decorating this interesting church, which was restored a few years back by the exertions of the Rev. W. P. A. Campbell, who was in charge of the parish at the time.

Lichfield Cathedral.—A stained-glass window, to the memory of the late Mrs. Spode, of Hawksyard Park, has just been placed in this cathedral. There are three principal lights, the centre showing our Saviour on the cross, the right the figure of St. Helena, and the left the Resurrection. The principal subject in the lower part of the window is the Temptation, and the upper part is filled with a variety of subjects, embellished with tracery. The work is from Hardman's, of Birmingham.

Aldford Church.—The Marquis of Westminster has erected a stained window in the eastern end of this church, in memory of his father.

Books Received.

MESSRS. LOCKWOOD & Co. have taken Chaucer's fame under their protection. We have from them a second edition of their revised version of his works, fitted for family reading, called "The Riches of Chaucer," with a New Memoir of the poet, by Mr. Charles Cowden Clarke, the whole well printed, and agreeably illustrated; also a second edition of "Tales from Chaucer," by Mr. C. C. Clarke, which makes a very amusing story-book, and at the same time serves to lead to the study of his works in their original poetical dress. We can commend it.——The artist illustrated in the current number of the *Art-Journal*, is Mr. Henry Stacy Marks, a painter yearly making progress in public opinion. Engravings are given of three of his best pictures. An engraving of "The Miracle of St. Mark," by A. Fleischmann after Tintoretto, conveys the spirit of the master remarkably well.——*Temple Bar* for December (Bentley), includes a charming account by Hans Christian Andersen, of "A Visit to Charles Dickens."——*London Society* (also published by Bentley now) has its usual number of amusing stories and engravings. "The Foreign Settlement in Soho," one of the papers in it, gives a truthful picture of the locality. The Christmas number of this periodical includes seven full-page illustrations, and is altogether a good one of its class.——The Christmas number of *English Society*, conducted by Mr. James Hogg, who founded *London Society*, has eight such illustrations, and a considerable amount of amusing writing. The conductor has wisely adopted larger type than that used in the first-named.——We get from a more than ordinarily clever paper about Liverpool, in *Fraser's Magazine*, these lines, which have a wide and weighty application. If they were to sink well into the public mind, something would be hatched. They are addressed to

An Egg Merchant.

"What the deuce is your use? You nothing produce,
You never lay eggs. Oh, you're a transmitter.
If A has an egg intended for me,
He hands it to B, B to C, C to D,
D to E, E to me—who pay, after A,
B, C, D, and E, for stopping the way;
For surely 'twere fitter A's egg and my penny
Changed hands without paying a toll to so many,
Which terribly docks Farmer A of his gain,
While of eggs hardly fresh I often complain."

——The *British Workman*, the *Band of Hope Review*, and the *Children's Friend*, all published by Partridge & Co., pursue their important course (yes! important), and give for a penny or a halfpenny such wood engravings and such sound good English writing as were not obtainable a few years ago for many times the money.——Messrs. Cassell, Petter, & Galpin have added to their many educational periodicals the *Technical Educator*, intended to be a practical sequel of their *Popular Educator*, the usefulness of which is considerable. Some of the departments of the *Technical Educator* appear to be in very good hands, but as to others we are not sure. Architecture should be treated by a professional and experienced architect; engineering and surveying by experienced engineers and surveyors; architectural drawing by an architect or under the guidance of one. If this be admitted, then it stands to reason that building construction,—the manipulatory or workman portion,—ought to be treated by some intelligent builder, who, either having been once a workman himself, or having paid peculiar attention to planning, designing, and workmanship, would be able to write practically on the subject. Messrs. Cassell can improve their series much by securing the services of intelligent masters or workmen in the different trades and occupations which they intend to treat of in their work.——Under the title "Christmastide," the conductor of the *Leisure Hour*, Dr. Macaulay, issues for the first time a Christmas part of his popular and good periodical, and a very satisfactory part, or rather whole, it is, brimful of amusing carefully-revised stories, essays, and engravings. Amongst the first we may signalise "A Miserable Christmas and a Happy New Year," by Hesba Stretton; and from the second take "Notes on Nursery Nonsense," by Somerset Herald. The latter is a capital paper, full of quaint suggestiveness, and is artistically illustrated. The circulation of the *Leisure Hour* shows what a large public there is for an amusing safe periodical. The *Sunday at Home* is issued by the same society, and we are told on the best authority that the circulation of the two together is above 220,000, that of the *Sunday at Home* being the larger of the two.

Miscellanea.

The Metropolitan Board of Works.—This Board has decided not to grant the request of the Bethnal-green Vestry, asking them to open up a new thoroughfare from High-street, Shoreditch—which it is the intention of the Board to widen—to Bethnal-green-road. The improvement would cost nearly half a million of money, not a penny of which Bethnal-green was willing to contribute. The Board were, for the most part, unaffected by the arguments of Mr. Bevan and Mr. Newton, the former of whom proposed an amendment, that the Board should seek Parliamentary powers to enable them at once to set about making the new thoroughfare.——The Board, alarmed at the large amount paid to law stationers (about 2,500*l*. annually) for fair copying, determined to dispense with the services of the writers employed through the law stationers, and to employ them direct, and pay them by the hour, at the same rate of pay which they received from the law stationers. The persons so engaged, however, have sent in a memorial to the Board, stating that, owing to a rule of the trade, they are prohibited from accepting work direct from an employer, and are therefore reluctantly compelled, unless the work came through a law stationer, to decline the business of the Board. The matter has been referred to a committee for consideration.

St. Leonard's Tower, Bridgnorth.—The re-erection of this tower will now be proceeded with under a contract with Messrs. Estcourt, of Gloucester. At a meeting, held on Friday, the estimate of this firm, amounting to 2,708*l*., was accepted for the work; but this does not include the cost of the bells, groinings, turret, pinnacle, and other contingencies. The sum already subscribed is 1,769*l*., leaving a deficiency of 999*l*. to be collected in order to meet the estimated outlay on the tower.

Stone Preservation.—We hear that at the recommendation of Professor Abel the process invented by Messrs. Gay & Co., of Alton, Hants, for waterproofing and preserving stone and other buildings, is, by the order of the Office of Works, to be applied to the decayed stonework of the Houses of Parliament. It ought, perhaps, rather to be said "some" of the stonework.

Death-rate at Blackburn.—The death-rate of Blackburn having been unusually high twelve months ago, on the invitation of the town council a conference of medical men has lately assembled to ascertain the causes of it, with a view of preventing a similar occurrence this winter. Their report was handed in to the town council on Thursday, the 1st inst. The usual death-rate of Blackburn is 28 per 1,000, and it rose to 36 and 38 during the two quarters to which their attention was specially directed. They accounted for the propagation of fatal diseases by—1, the injury arising from smoke; 2, impure water-supply; 3, the condition of surface and underground drainage; 4, the overcrowding of dwelling-houses and want of ventilation; 5, open cesspools; 6, the existence of slaughter-houses and piggeries in crowded districts; 7, the use of organic refuse in filling up hollow spaces; 8, infant mortality; and 9, steam, in relation to its effects upon the health of workpeople employed in mills. The water of the town, on being analysed by Mr. Crace Calvert, of Manchester, was found to contain 10·40 grains of solid residue per gallon, and infusorial life was five times as great as in the water at present supplied by the Manchester corporation.

Decoration of Ospringe Church, Kent.—The chancel of this church has just been decorated by Messrs. Holden & Son, of Lambs-conduit-street, after a design prepared by Mr. E. L. Blackburn, architect. The boarding of the roof is grounded in white, with ornamental bands, the rafters and tie-beams being banded in red, white, and blue. Masonry, interspersed with bands of various patterns, forms the decorations on the walls, with Gothic drapery on each side, and the east wall is further enriched with Gothic drapery bearing the sacred monogram. Above the east window are angels in the posture of worship, and on the jambs of the windows are figures of the patron saints, Peter and Paul. The Tudor window on the north side bears the Tudor crest (pomegranate, Tudor rose, and portcullis) in the blocks of masonry, the other windows and arch having pateræ in the blocks of masonry. The sedilia on the south side has been ornamented with a canopy of satisfactory design. The cost of the decorations is the gift of St. John's College.

Hamilton-place and Park-lane.—We must again urge the importance of proceeding rapidly with the desired improvement of Park-lane. We are informed that the following is the correct state of the negotiations for the purchase of the necessary property. The freehold of all the houses and land belonged to the Crown, and this has been bought and paid for. The three houses required,—viz., Sir Edward Kerrison's, Mr. Butler Johnson Monro's, and Mrs. Blyth's, all on the east side of Hamilton-place,—were referred to the arbitrament of Mr. Clifton, and he gave his award in all three cases on Thursday, the 1st inst. The stables on the east side also have to be altered. The drawings for the contract are approved, and the tender will be delivered next week. There only remain two or three unimportant claims, because Hyde Park is not interfered with, but only a small piece of enclosed land at the end of Hamilton-place, which is included in the purchase of the freehold.

Gravesend Property.—The following prices were realised for freehold property in Gravesend at a sale by auction, at the New Falcon Hotel, last week:—Freehold house, No. 3, Edwin-street, let at 26*l*. per annum, purchaser, Mr. Jennett, 350*l*.; freehold house, No. 78, Edwin-street, annual rental 18*l*., Mr. J. T. Cooper, 220*l*.; freehold house, No. 33, Parrock-street, estimated annual rental 24*l*., purchaser, Mr. Pilkinton, 265*l*.; freehold cottage, No. 3, Star-cottages, Clarence-street, with slip of land adjoining, annual rental 20*l*. 16*s*., Mr. Spain, 205*l*.; two freehold cottages, Nos. 4 and 5, Star-cottages, Clarence-street, let at 14*l*. 6*s*. and 13*l*. 17*s*. 4*d*., Mr. Clarke, 270*l*.

Opening of Cork Cathedral.—The Protestant Cathedral of Cork, erected from the designs of Mr. Burges, was consecrated on the 30th ult. The cost, to the present time, is stated to be 36,000*l*. The building is of large dimensions, the nave being 162 ft. long. It is built of Cork and Carlow limestone. The chancel is separated from the nave and aisles by eight pillars, of red Cork marble, and seven broad steps of a Sicilian marble lead from the nave to the chancel. A view of the interior will be found in the *Builder*.

Explosion at the Gasworks, Rochdale-road, Manchester.—Two men have been killed by an explosion at the Rochdale-road Gasworks. An inquest touching their deaths has been held. Mr. Henry Lyons, manager of the works, gave evidence, and stated that the explosion was in the first place attributable to the valve of the exhauster having been sprung by the workmen in a screwing-up process, which converted the plane surface of the valve into an undulating one; and, in the second place, to a leakage at or near the exhauster. Besides himself, witness said that Mr. Adam Woodward and Mr. Hopkinson, both engineers, and members of the gas committee, were present and fully investigated the matter. He believed they entirely concurred with his view; but on their part the matter was left open for further investigation with a view to prevent anything occurring for the future. After the explosion, one of the men was heard groaning, and the poor man said that while assisting at the valve he thought he smelt gas, and applied a light to the place. The explosion followed. The jury returned a verdict of accidental death.

"The Sanatorium," Weston-super-Mare.—The annual meeting has been held, presided over by Mr. R. A. Kinglake. It appeared from the secretaries' reports, that since the last meeting 320 patients had been admitted, each remaining twenty-three days on the average. Increased accommodation was needed, for the lack of which the committee had been compelled to refuse cases. Office-bearers were elected or re-elected, and other business done. If corporations and local Boards were compelled to do their duty in attending to the sanitary wants of their district, "Sanatoriums" would soon become a thing of the past, like lesser hospitals. Are there not sanatoriums of some kind necessary, too, for the habitual drunkards of all ranks, or, irrespective of grade, would not a few revolutions on the treadmill, daily, restore the patient to sober consciousness and convalescence?

Baths at University College Hospital.—The details of the plans for the new baths have been finally approved, and their erection will at once be commenced. The original estimate for the baths was about 1,000*l.*; but certain alterations have been considered advisable, and the cost will now be 1,310*l.* The mercurial and sulphur baths, occupying a space of 15 ft. by 11 ft., with an adjoining hot chamber (7 ft. by 5 ft.) for the disinfection of the clothes of patients suffering from itch and phtheiriasis, are quite separate from the other baths, and have a distinct entrance away from the general bath-hall and the Russian bath, whilst the fumes therefrom are conveyed away to the top of the building by a special pipe. The whole of the baths will be warmed by hot-water pipes, the walls cemented, and the floors tiled, so as to be easily and thoroughly cleansed. The architect is Mr. M. P. Manning.

The Ventnor Hospital for Consumption. Considerable efforts are being made in aid of the National Hospital for Consumption, on the separate or cottage principle, erecting near Ventnor, Undercliff, Isle of Wight. The committee, in anticipation of the completion of the third pair of houses, now being erected at the entire cost of two gentlemen, and for the purpose of obtaining funds to defray the expense of furnishing and opening these houses for the reception of patients, have decided to hold, early in the spring, a fancy bazaar in the Duke of Wellington's Riding School, Knightsbridge. We willingly repeat the expression of the committee's hope that any ladies who may be willing to act or have their names placed on the ladies' committee, or who intend to contribute any articles for sale, will communicate their wishes to the secretary, Mr. Neale F. Horne, 2, Adelphi-terrace, Strand, London.

Improvements in Fire-grates.—A patent has been taken out by Mr. John Milne, of St. Andrews, for a fire-grate, which heats air introduced by a pipe either from outside or from the room, as desired, and discharges it, when heated, into the room, instead of allowing so much to escape, as in ordinary cases, up the chimney. Such a purpose has often been the subject of patents,—*e.g.*, Welch's patent, and various others, though the means adopted differ.

Royal Institute of Architects of Ireland. The present president, and whose address we printed in our last, is Mr. James H. Owen.

Asserted Encroachments in Hyde Park.—A meeting of ratepayers has been held in the Vestry-hall, Kensington, to consider whether any and what steps should be taken to protect the rights of the public in Hyde-park, Kensington-gardens, and the Kensington-road. The Rev. C. Darby Reade was elected to preside. It was unanimously resolved that the meeting, having heard the statement made by Mr. Dexter and Dr. Dudfield, was of opinion that steps should be at once taken to protest against the rights of the public in Hyde-park, Kensington-gardens, and the Kensington-road being infringed upon, without, at all events, the consent of Parliament. Mr. Dexter explained that the first step proposed to be taken was to get a legal opinion as to the rights of the people in respect to the property in question. This, and protesting against encroachments without consent of Parliament, was all that could be done until next session. Another resolution was passed, appointing a committee to carry out the views embodied in the first resolution. Among the names of the committee mentioned were Sir Henry Hoare, M.P., Dr. Gladstone, Mr. Shaen, and Monsignor Capel. It was understood that the committee should elicit the opinion of the public by means of meetings. It was further resolved that a subscription-list should be opened to meet the expenses of the movement.

Railways and their System of Ballasting.—A letter from Mr. T. Prideaux appears in the *Sheffield Daily Telegraph*, in which Mr. Prideaux says:—"I propose that concrete be used as a foundation for the sleepers to rest upon, and also for the filling up of the same. It is a well-known fact that lime or cement will protect wood, and cause it to last longer than either tar or any other ingredient that has yet been discovered. Concrete forms a very impervious body, and will resist any amount of wet. It is as easily repaired as the loose ballast, of the present system, but with a little more cost of labour. The great difficulty with loose ballast is that the water percolates through it and decays the sleepers. I suggest that when more drainage is required the pipes should be laid at a sufficient depth, in order to provide for a dry bed, and then, if required, a drainage also might be made between the two sets of rails, the slopes being laid with concrete. . . . I think that the ballast commonly used might be formed into concrete with the aid of cement or strong hydraulic limes, and the repairs would cost very little more than ballast does."

Royal Academy Students.—On Thursday evening, the 1st, on the occasion of a supper at Simpson's Hotel, given to Mr. William Holyoake, by the students of the Royal Academy, a testimonial, consisting of a folio of original sketches, and a selection of photographs from the old masters, was presented to that gentleman as a mark of respect for the manner in which he had acquitted himself as curator of the Painting School of the Royal Academy, an office he has just resigned. The chair was taken by Mr. Valentine Prinsep.

Blasting.—At Tregarden Quarry, Luxulyan, Cornwall, the property of the South Cornwall Granite Company, situate in the lands of Mrs. Foster, of Castle, probably the largest block on record ever blasted and entirely removed from its native bed at one time, was performed on the 26th November, by one charge of powder, weighing 20 lb. (supplied by the Cornwall Blasting Powder Company). The rock thus removed consists of fine granite, measuring 41 ft. 6 in. in length, by 34 ft. in breadth, and 8 ft. 6 in. in height, and contains 856½ tons of pure stone.

Proposed Tramway to Watford.—A company has been formed to construct a Tramway from Watford to London. The tramway will, if carried out, commence at a point near the Essex Arms, pass down the High-street over Watford Bridge, and go through Bushey, Sparrows Herne, Bushey Heath, Great and Little Stanmore, Edgware, Kingsbury, Cricklewood, and the Slade to Kilburn, finally terminating near the Cock, at Kilburn. It will then be in communication with the Metropolitan system of tramways.

The Institution of Civil Engineers.—At the meeting of this society on Tuesday, the 6th inst., Mr. Charles B. Vignoles, F.R.S., President, in the chair, the first ballot for the present session was taken, when thirty-seven candidates were balloted for and declared to be duly elected, including eleven members.

The New Police-station, Beaconsfield.—This station has been completed. It is built on land leased for a term of 999 years, at a ground-rent of 5*l.* per annum, and the cost has been 1,300*l.* The architect was Mr. Charles Carter, of Great Marlow, county surveyor; and the builder, Mr. William Child, of Beaconsfield. It is built of red brick, with Bath stone dressings to the windows, and over the principal entrance are the arms of the county,—a swan,—carved in stone. The court-room is 37 ft. long, 17 ft. wide, and 20 ft. in height. There is a magistrates' retiring-room, 12 ft. by 10 ft., and a witnesses' room, of the same dimensions. The cells are four in number, the dimensions of each being 10 ft. by 9½ ft., and the height 6½ ft. They are warmed by hot-water pipes, fitted by Messrs. Meaks, of Reading. The guard-room is 16 ft. by 12 ft., and it is 10 ft. high. There is accommodation for a married inspector. Provision is also made for the residence of one police constable.

A Narrow Escape.—At the new Wesleyan chapel in course of erection at Middleton-in-Teesdale an accident happened, which proved all but fatal. The masons are now engaged in finishing the walling above the window-heads, the walls now being full height, and one of the labourers outweighed the scaffold, when it fell, and the man that was standing upon it just had time to seize hold of the top of the wall. He held on in this dangerous position for nearly five minutes, when he was rescued by some of his fellow workmen. Had he slipped his hold, or the stones given way, he would have fallen a height of 50 ft.

Society for the Study of Biblical Lands. A meeting has been held in Mr. Bonomi's rooms to consider the desirability of forming a society having for its objects the investigation of the archæology, history, and chronology of ancient and modern Assyria, Palestine, Egypt, and other Biblical lands, the promotion of the study of the antiquities of those countries, and the preservation of a continuous record of discoveries now in progress. At that meeting it was resolved that a society having the above-mentioned objects should be instituted, and a committee was formed to prepare the rules of the proposed society. A further meeting to receive the report of the provisional committee, discuss the regulations, and decide upon sundry matters connected with the society, is to be held this Friday evening. Mr. W. R. Cooper is the secretary *pro tem.*

Schools of the Haberdashers' Company. This Company having determined to make some additions to their Free Grammar School, Monmouth, the foundation-stone of the new buildings was laid on Wednesday, November 23rd, by Mr. W. Hawes, the then master, expressing as he did so a hope that it would prove the first stone of a new series of buildings which would enable the school to rank high amongst similar institutions of the country. A brass tablet on the stone bears this inscription:—"This stone was laid by William Hawes, Esq., Master of the Worshipful Company of Haberdashers, T. Higgs, Esq., W. H. Skyring, Esq., W. Liddiard, Esq., W. Hale, Esq., Wardens, November 23rd, 1870." Mr. Snooke, the architect, presented Mr. Hawes with the trowel and hammer used on the occasion.

Wigan Undermined.—An alarming discovery with regard to the public streets of Wigan has just been made. Under some of the principal streets it has been found that there are, at no great distance from the surface, some old colliery workings in a very insecure state, and the public health committee of the corporation has taken steps for at once securing the safety of the streets lying above the mines, which at present are in a very dangerous condition.

Science in Liverpool.—A conference of gentlemen interested in scientific education was held in the Royal Institution, Liverpool, on Tuesday night, and passed unanimously a resolution declaring the advisability of establishing a Science College in that town, the cost of which was estimated at about 50,000*l.* A committee was appointed to take steps with the view of carrying out the object.

The Brighton Baths.—The baths in the Brighton building described as,—"made of *iron* in one piece, and covered with a white enamel, which gives them the appearance of porcelain, possessing the requisite of perfect cleanliness without unnecessary trouble," are in truth of porcelain in one piece, as designed by his late Royal Highness the Prince Consort, and supplied by Mr. J. Finch.

The Builder.

VOL. XXVIII.—No. 1454.

Architects and the Public.

IN the opening address of the President of the Institute, which we recently printed, the desirability of making some general instruction in the principles of architectural design a part of anything that should be called a "liberal education," was strongly and surely not unreasonably urged. All architects who have had to fight with prejudiced and ignorant clients, and endeavour to persuade them, against their will, to allow of the erection of a truly architectural design, must concur with Mr. Wyatt in bearing witness to the difficulties thrown in the way of architectural progress by popular ignorance of, and consequent want of sympathy with, architecture as an art. It is quite within the mark to say that not only the mass of English people, but the majority even of that selected class who are called and considered "well-educated," are totally ignorant of the first principles of architectural design, and equally indifferent on the subject. The general remedy for this state of things, suggested in the address referred to, viz., the instruction of non-professional students "in the *principles* of sound art, whether of architecture, painting, or sculpture," is no doubt, as a broad statement, to be accepted as the right one; though a remedy which cannot be brought into operation, we fear, all at once. In the meantime, there are one or two considerations in connexion with the subject of non-professional appreciation of architecture which may deserve a moment's attention.

A good deal of misconception would be cleared away, and a great deal of absurd pretentiousness put an end to, if the distinction between archæology and architecture, as objects of study, were once made clear to the popular mind. Since the Gothic revival, what is called architectural study has become an object of some attention, especially with the clergy, and with well-educated young ladies of ecclesiastic propensities. But in fact this almost entirely (with the clergy we may say entirely) takes the form merely of a study of the details and chronological sequence of one style, without any reference to equally important styles of other ages and climes, still less with any recognition of the real principles of architecture embodied in the one style that is studied, or of the constructive basis of the said style. Indeed, the most popular works on Gothic architecture are by amateurs who have themselves no further knowledge than that which they offer to their readers, namely, a superficial knowledge of certain facts connected with the favourite style. Without wishing to say anything censorious of a large and estimable body, we must be allowed to remark that the pretentions to architectural criticism made by many of the clergy, and the tone in which they speak of Gothic architecture as something specially belonging to them, and upon which they have a right to speak with authority, are simply absurd, and betray an ignorance both of the art itself and of their own position with regard to it. A great deal is done in this way to perpetuate misconceptions and prejudices on the subject of architecture; and it is only a short while since we heard of the delivery, in one of our cathedral towns, of a lecture, eloquent but visionary, in illustration of the old and (as we hoped) exploded notion of the derivation of Gothic architecture from the study of the forms of trees and foliage; and this by Canon Kingsley, a church dignitary whose name is widely known also in the literary world, and whose opinions were probably received by most of his audience with unquestioning faith. It is really too bad that professional architects who are taking some trouble (as a few are) to interest and instruct the public in the true principles of their art, should have their efforts in this direction interfered with, and to some extent frustrated, by persons who assume to be teachers without understanding the subject at all. If these reverend gentlemen had (what they seldom have) some notion of the general principles and foundation of architectural design, they would be able, perhaps, to estimate their own knowledge of the art more justly, and not be so ready to dogmatise and lay down the law on matters of which many a student in an architect's office is a better judge than themselves.

Akin to clerical dilettantism on the subject, and perhaps a good deal more inexcusable, is journalistic ignorance and indifference. As a general rule, it may probably be said that there is no class of educated men more indifferent to art in general, and more ignorant of it, than those who are commonly called "literary men,"—that class especially who furnish the columns of our daily and weekly papers with readable articles, and feed the public with food convenient for them. It has dawned upon the minds of newspaper editors, however, that their readers must be presented with passable critical articles on the current productions in music and painting of the day; and in some of our journals articles on these subjects appear which (making allowance for personal partiality) are, in the main, good, and in some few cases deserve the name of art criticism. But even the journals which give the best attention to these things treat architecture with complete neglect. If a concert or an exhibition is to be reviewed, some one competent to review it may be entrusted with the task; but on the rare occasions when an English newspaper condescends to notice a work of architecture, it is considered sufficient if a few neat sentences are strung together, bestowing the proper amount of compliment all round (except to the architect, who must generally be content if he gets his name mentioned, and not always that), and giving a few practical details as to materials and furnishing of the building, jotted down by a short-hand writer from information given by the contractor or clerk of works. This is about the staple of architectural writing in literary journals and newspapers; and as to anything like criticism of the building, the young man on the newspaper staff is not aware that a building can be criticised, or that there is anything to criticise in it. If this were excusable with ordinary newspapers, at least it is not so with those publications which herald themselves as reviews of "literature, science, and *art*;" but in these cases the only difference is, that the literary form of the contribution is sometimes (not always) better; and (to notice but one instance only) it is but too evident that the articles on sundry of the English cathedrals (York, Lincoln, &c.), which recently appeared in the pages of the *Saturday Review*, were the mere jottings of some amateur *littérateur*, possessed of a superficial knowledge of Gothic forms and nomenclature, but without any faculty of architectural criticism. One style of notice the architectural profession, however, does occasionally get from the columns of newspapers; namely, when some question is raised as to a large public building, about which it is supposed that a sensational interest may be got up by a well-spiced "leader" or two. Then does even the *Times* bestir itself, and some anonymous writer, seated securely in his study, assumes the license to treat with contempt, and even contumely, the whole profession of architects, and to lecture them *ex cathedrâ* on matters to which he has never himself given a serious thought, and on which he has no reliable information. These gentlemen probably imagine architecture to be as Hamlet puts it, "as easy as lying." Unfortunately, however, the public in general, who are getting more and more accustomed to take their ideas from the papers, receive this sort of writing for gospel; and there will probably be no cure for this but by educating the readers of the newspapers better: the writers are far too wise in their own conceit to admit that their *dicta* should be called in question.

It is to want of knowledge and perception with regard to what constitutes the art of architecture that we must in a great measure set down, also, the harsh and one-sided treatment which architects frequently receive at the hands of the law. The whole of the misconception and injustice, recently so unpleasantly demonstrative with regard to the architect's property in his own drawings, springs in the main from the total want of understanding on the part alike of architects' clients and their legal advisers, as to what the process of architectural design really is, what part in that process the drawings occupy, and, in fine, for *what* it is that the client pays. It is, we must, charitably suppose, this kind of ignorance (if it be not a determination not to understand) which influenced the judgment of several of our leading judges, the other day, against an architect who wished to retain his own property, but was told in terms of the greatest contempt that his claim was an absurd one. The judges were evidently under the impression that the business of an architect was to draw, and that the drawings were a *sine quâ non* in the matter. A little knowledge of the principles of architecture might have taught those otherwise learned personages to have taken a different view, or, at the least, to have seen that there were two sides to the question, even as a matter of common equity and fair play.

We have noted two or three salient instances of the stumbling-blocks thrown in the way of the architect in pursuing his calling, by the lack of intelligent interest in his profession, on the part of certain classes whose opinion has, owing to circumstances, considerable practical weight with the rest of the public; viz., the clergy, the journalists, and the members of the legal profession. All these are looked upon, or become practically on occasion, as in a measure leaders of public opinion. With regard to the general public, the obstacle is mainly a negative one,—that presented by sheer indifference; and this acts detrimentally to architecture, as an art rather than as a profession, by inducing people either to demand from an architect at the outset a mere piece of archæological sham, the "counterfeit presentment" of some building which his client has taken a fancy to, or by furnishing excuse for the refusal of the necessary funds for anything like ornamental architecture, and restricting him a design to bare necessities. It is as a remedy for this state of things that the suggestion, once more repeated, of making the general principles of art (including architecture) a part of a liberal education, ought to be at every

opportunity recommended and encouraged by those who have at heart the future dignity and usefulness of their profession. It is really absurd in the last degree, that a man can take the highest honours which our principal universities have to bestow, without possessing the slightest glimmering of a perception as to the origin, history, or æsthetic basis of any one of those arts which, rightly considered, lead to the highest pleasure which the human intellect is capable of receiving. And, without for a moment placing architecture before the sister arts, it may be said, nevertheless, that some knowledge of this art on the part of the public is peculiarly called for, seeing that it is one so closely bound up with our national and social life; and that with regard to its largest and most expensive developments, there are almost always a large number of persons whose interests and wishes have to be consulted, besides the architect and his immediate client; while it is also the only one of the arts which a man cannot have for his purely private possession, even if he would, but which must be open to the view of his neighbours, to their pleasure or annoyance. It will take some time, probably, to persuade our educational authorities to move in the matter, or to recognise it as worth their attention; but one way in which members of the architectural profession might do something by way of awakening a little more public interest in their art, is by taking opportunities of lecturing on the subject from time to time. People will generally come to hear an illustrated lecture, which any lecture on architecture must necessarily be; and there are, probably, many who would be quite capable of taking an interest in it if they knew a little more about it, and who only imagine it to be a dull subject because it has never been properly set before them. On the other hand, we should guard against anything which would have a tendency to encourage dilettantism, so far as that term is taken to mean amateur dabbling in design, and interfering with the architect's work. Every architect knows from experience that there is no more troublesome and worrying client than the one who fancies he knows something about architecture, and who is perpetually wanting him to satisfy some whim or other either in design or plan. "I must keep this book out of the way of my clients," said a prudent practitioner, hiding away carefully a copy of a well-known work on house planning; "if they get sight of it, I shall have no peace." We do not want our clients to be pretending to a knowledge of the details of the architectural profession, on the strength of pickings from works on architecture; and to be obstructing us in our designs by an incessant desire to carry out what the Americans would call "notions" of their own. But we do want the public in general, our employers, to have an intelligent knowledge of the outlines and basis of our profession, to understand what it is that we are about, and to second us not only with the spirit, but with the understanding also. And in this respect the architects will have to do what it has been said all great poets have had to accomplish, to create and foster the taste whereby they may themselves be understood.

THE LUMBER TRADE OF CANADA.

When the confederation of the British North American Provinces is completed, by the adhesion of Newfoundland, Prince Edward's Island, Vancouver's Island, and British Columbia, to the Union, the Dominion of Canada then, stretching from the Atlantic to the Pacific Ocean, and from the river St. Lawrence and the great lakes to the Arctic Ocean, will contain 3,389,945 square miles, an area almost as large as Europe. It has not such a variety of climate, and it does not contain so large an area of good land as the United States. Still, the climate is healthy, and there are as much fertile land and natural resources as would need ages to develope, and upon its surface a great and free country might be built up beneath the shelter of the British flag. Apart from her agriculture, the lumber trade of Canada is the most important of her industries; and as many of the readers of the *Builder* may desire to learn something of it, with your permission, I will describe for them what I have learned in reference to it, here in the great centre of the trade, by observation and inquiry, and up in the heart of the forest, which, let me state, is very unlike the woods of knolled stems and spreading branches in Old England, where a man on horseback might ride through them. Here the trees grow quite close and straight, without a branch except towards the top, and very little underwood is to be met with, unless in the neighbourhood of the settled country, where brush and fallen trees are so thick that only on recognised paths can you pass through. Here and there you may meet a red-pine grove, without a twig of brushwood or a clear spot, upon a stream, from which the beavers have cleared the timber, and upon which a wild grass now grows; that is called a beaver meadow. Before the busy hands of man laid the axe to their roots, the forests of Canada extended from the St. Lawrence and the edge of the great lakes far up to the Arctic Ocean; but now that a large tract of country along those shores is studded with comfortable homesteads and well-cleared farms, the forests may be properly said to begin at the foot and on the great range of Laurentine rocks, which, running from the Gulf to the north shore of Lake Superior, forms the basin of the St. Lawrence. This region, high above the level of the sea, is filled with lakes and lakelets, in which the great rivers take their rise that drain all the level country, and, as they often flow over large ledges of rocks, they form cataracts and rapids of rare grandeur and beauty. Those rivers run through the most extensive timber territories of Canada, the pine-producing districts of which have an area north of the St. Lawrence of about 287,711 square miles; and that district upon which the finer hard woods are to be found, wholly or in part, is about 22,000 square miles. The best white pine, red pine, and ash are chiefly obtained from the country drained by the Ottawa, 75,000 square miles. The St. Maurice and its tributaries, draining an area of 22,000 square miles, which contains large quantities of white, yellow, and red pine, spruce, birch, maple, and elm. The Saguenay country, 21,000 square miles, is rich in white and red pine, spruce, birch, and tamarac. The Trent Valley, 6,200 square miles, has pines and hard wood. On the northern shore of Lake Huron there are red and white pine, spruce, cedar, birch, and maple. The peninsula of Gaspé, on the Gulf of the St. Lawrence, contains white and red pine, spruce, tamarac, and birch. In the territory north of Lake Ontario there are still uncleared some white pine, elm, and maple; and on the peninsula of Ontario West some oak, elm, and walnut. This district was covered with the finer kind of hard woods, and the settlers, in their haste to clear their farms, cut down and burned millions of cubic feet, which, if they could have found a market for, would have been to them a mine of wealth. Now the principal supply of walnut even for Canada comes from Southern Indiana. In New Brunswick and Nova Scotia the finer kind of white pine is worked from off the land. Coarse pine and black spruce are now the only kinds of timber manufactured, while lumbering, as a trade, cannot be said to exist in Newfoundland or Prince Edward's Island. Over 80,000,000 cubic feet of timber are annually cut down in the forests of Canada, 13,000,000 dollars worth of which is exported to Europe and the United States, Great Britain alone taking 8,000,000 dollars worth. In its manufacture 15,000 men are employed in the forests; and in the saw and planing mills, where it is prepared for exportation, there are 10,000 men employed. In the transportation of that portion of the trade which leaves Quebec, over 1,200 large ships and 17,000 seamen are engaged, and if you add those employed in the navigation of the rivers and lakes, and in the transit of partially manufactured material to the United States, there would be 25,000 men engaged in transportation, or a total of 50,000 men employed altogether. Its freight for shipment is over 1,500,000 tons, and its accessories half as much more; and for the supply of this great industrial army, 26,000 tons of agricultural produce is annually required. The principal part of the forest lands in the Canadian dominion belong to the Governments of the different provinces.

The lumber manufacturer obtains the area upon which he works by bidding the highest price for it, at auction, generally from 1 dollar to 1½ dollar the square mile. It is technically called a timber berth or limits; theoretically, it is 10 miles square, or 100 square miles; but, owing to the topographical features of the country, they are of all sizes, from 24 square miles upwards. The limit-holder becomes a yearly tenant to the Government at a fixed rent, and in addition pays a duty of one halfpenny per cubic foot of square timber got out, and of 5d. on each standard log of 12 ft. long and 21 inches in diameter. 31,600 square miles of forest were rented in 1867, from which the Government derived a revenue of 361,670 dollars. All the operations connected with the lumber trade are costly. Streams have to be improved, roads, bridges, and chantiers to be constructed, and often large farms cleared for the pasturage of the cattle necessary to haul the timber or saw-logs to the nearest stream. Winter is the period during which the greater part of these operations are carried on. The square timber must be selected with care, nearly perfectly straight, and entirely free from knolls, shakes, or other blemishes. It must be hewed perfectly square, and must carry the same thickness throughout, a very slight taper indeed being allowable. It must be over 30 ft. in length, and square at least 15 in. About one twenty-fifth of the standing pine is available for square timber, and fully 40 per cent. of the remainder is available for saw-logs, the balance, 35 per cent., being under growth or damaged. The loss in the manufacture of square timber is considerable, especially when it is of large growth, and will square over 18 in.; it may be taken at 20 per cent. Very often splendid pieces of timber are left on the ground because they will not square evenly throughout.

Many of the men engaged in the lumber trade have considerable capital, more especially the owners of the large saw-mills, all of which are stopped throughout the winter for want of logs. They send the men up to their limits, to cut down and provide the next summer's supply. In the woods they are furnished by the employer or his agents with all the food, clothes, and other necessaries which they require, while their families receive a portion of their wages for their support from the office at home; but the great majority of the lumberers are provided with means for carrying on operations in the woods by parties in Quebec; it is advanced by instalments, the first being used to buy and provide provisions and other necessaries, consequently they are soon out of funds, but they must have the men. Some years ago, when emigration was brisk to Canada, the Irish labourers engaged largely in this trade; but now the supply is mainly from the French parishes of Quebec and from the highland settlements of Ontario, with a fair sprinkling of Irish. They flock up to Ottawa in the fall to seek employment in the woods, and as a general rule they arrive penniless; yet they are hospitably received by any of the numerous tavern-keepers who follow this particular line of business. When a lumberer wants men, he goes to one of these hosts, and says, "I want to hire so many men;" the host engages the required number, and, of course, his own lodgers. First, the men are all in debt to the tavern-keeper for board, and often for whisky and medical attendance. The lumberer has no more money left than will convey those men to the scene of their labours, often 400 miles up in the woods; so he gives his due bill for each man's debts and for the men's wages, payable when the timber arrives at Quebec. Should the raft be wrecked or burnt, the tavern-keeper loses his money, and the men lose their wages; or should it be left in the forest by the falling of the water, "stuck," as it is called, and so delayed a year in getting to the market, they have to wait. The butcher, the baker, and the physician,—all wait upon the tavern-keeper, who waits upon the lumberer, who waits upon the furnisher, who waits upon the bank, which sits like a spider in the midst of this great commercial net, always sure of its prey. Thus by the issue of notes in Quebec, one of the greatest industries of Canada is carried on, while its requirements give rise to a class of tavern-keepers, who evidently grow rich at the expense of a simple-minded and hard-working class of men. The wages paid to choppers and teamsters are from 14 dollars to 20 dollars a month, with board; and to hewers from 30 dollars to 40 dollars a month, and board. As before stated, the winter is the season during which the principal part of the timber manufacture is carried on; but as early as the middle of September you can meet those men in hundreds going on the Upper Ottawa, the great highway to the forests, I travelled with them almost to its source, and in justice I must state that a more orderly class of men going to such laborious occupations I was never in company with. When arrived at the scene of their labours, their first care is to select a good site for the shanty or log-house in which they are to reside; one by the course of a stream is usually selected, more especially if the ground is high and dry. It is soon erected.

These are the men to build a log-house, for no men in the world can use an axe with such dexterity, with the timber cleared off the site, which is cut into lengths of about 30 ft., halved and dovetailed on the ends. They are piled one over another, to a height of about 10 ft.; openings are cut for the doors and windows, and the intersections between the logs filled with moss or clay. The roof is equally simple in its construction, on the ridge and furrow principle, formed by splitting logs of bass-wood, and taking out the heart, leaving the hollow sap. These are placed side by side up the roof, like so many gutters, and upon their joints another piece is placed, with the rounded side up. An opening of some 6 ft. square is left in the centre, through which the smoke ascends from a large fire kept always burning. A double tier of banks for the men to sleep in completes the edifice. At the end of the shanty a store-house is built for the provisions, and stabling for the horses not far off. Thus here, far away from the busy haunts of men, in those grand primeval forests, the solitude of which for ages was only disturbed by the howl of the wild beasts, or the savage Indian in pursuit of game, thousands of honest workers win their bread, more contented and happy than the denizens of your large towns and cities; and as the night brings to a close each day of toil, wrapped up in their blankets, lying in their hard bunks, with their heads to the wall all round, and their feet towards the warm fire, those shanty men enjoy that sweet repose which is best induced by honest useful labour. Each shanty is occupied by thirty or forty, and sometimes as many as fifty men, and is supplied with a cook and assistant to prepare the food,—generally salt beef or pork, with bread, potatoes, beans, or whatever other vegetables can be procured. Breakfast,—tea, a great beverage with them,—is taken before the daylight; dinner, at twelve o'clock; and supper when the day's work is completed. There is no lack of amusements until bed-time, some are playing cards or dominoes, while others laugh or sing, or replace the broken axe-handles. On Sunday, all the washing and mending is done, the letters from home answered, and the newspapers brought from the front by the teamsters read aloud for the whole company. The supply of 26,000 tons of agricultural produce as food for the men and horses employed in the woods is attended with much trouble and expense. Some of the lumberers clear farms on their limits, where they grow potatoes, oats, and hay, and they eagerly buy at high prices all that is to spare in the Border settlements, but the great bulk has to be brought up from the front. When the frozen snow is upon the ground, hundreds of teams drawing heavily-laden sleighs may be seen wending their way along the roads and forest-tracks to their several destinations. During his journey the teamster seldom seeks the shelter of a house, but, wrapped up in his buffalo robe beside a camp-fire in the woods, he refreshes himself and his horses.

When the shanty is built, and well stocked with provisions, the men commence their works, and are divided into gangs of four, namely, one liner, one hewer, and two scorers. Trees of proper size and quality are cut down and marked off with a chalk line to the size they will square, when the scorers cut off the rough, and the hewer, with a very broad axe, makes the sides perfectly straight and smooth. The top is then cut off, the piece is turned over, and the other sides completed. Each gang makes about five pieces a day. Any reasonably-sized tree is cut down for saw-logs, and made into 12 ft. lengths. All the timber made and saw-logs cut during the fall are placed on to large rollers, with oxen, and when the winter's snow is frozen on the ground, and the brush is cut away, they are dragged with teams of horses on the ice of the streams and rivers upon which they are to be floated down. When the whole quantity has been hauled out, which is generally done by the middle of the month of March, and when the ice breaks up, the workmen leave the shanties, and, dividing themselves into gangs, float the timber down the smaller streams to the main river. This is often a work of extreme difficulty and hardship, more especially when the streams are tortuous and narrow. For weeks they trudge on the banks, through mud and brushwood, constantly wet to the skin, and encamping where best they can at night. In the main river the square timber is formed into cribs, of 24 ft. wide, by string pieces and traverses, fastened on by withes made of young saplings, care being taken to avoid injuring the timber by any attachment. Seventy, eighty, and often one hundred of the cribs form a raft, usually containing about 100,000 ft., and each crib consists of from fifteen to twenty pieces, and contains from 800 ft. to 1,000 ft. The raft, when completed, is manned by fifteen to twenty men, who cook and sleep aboard, and guide and drive, with oars and sails, this mighty mass of wood down the river, until they reach a fall or rapids, which, in all Canadian rivers, are numerous and steep. On the navigable reaches of the river and on the lakes steamboats are now employed to tow the rafts; and, to avoid the destruction and damage which the timber annually passing underwent, the rafts are passed over the falls on inclined planes, called slides, erected by the Government for the purpose. A single crib is passed at a time, so that when all are over, the raft has to be again banded, or re-made. In the construction of those slides great engineering skill is displayed, and the most remarkable of them is the one built at the west end of Ottawa city, to obviate the magnificent Chaudière Falls. About 300 yards above them a certain portion of the river is dammed off, and turned into an artificial channel, down which the waters of the Ottawa river rush with terrific force and speed. As, however, a raft on such a steep incline, and hurried along by such a mass of water, would attain a speed which would destroy itself and all upon it, the fall of the shoot is broken at intervals by straight runs, along which it glides at comparatively reduced speed, till it again drops over and continues another headlong rush. Some of these runs terminate with a perpendicular drop of 4 ft. or 5 ft., over which the crib goes headlong, and wallows in the boiling water beneath till the current regains the mastery, and forces it on faster and more furiously than before. The crib has a kind of raised bridge for the lumberers to stand on, who, without such aid, would be washed off as the mass drops from shoot to shoot, and disappears some few feet under at each plunge. More than 40,000,000 cubic feet of timber come down the shoots of the Ottawa river every year, from which the Government derives a handsome revenue as slide dues. To go down the rapids of a timber slide is exhilarating: the immense speed, the rush of water, the succession of shoots stretching out before like sloping flights of stairs, the rough long straits into which the crib seems to dive and founder, letting the water up beneath, and over behind, till it is again urged forward whirling madly as if in a swing, the timber snapping and groaning and working like a bundle of reeds, getting a momentary rest with each incline, and again thumping over the straits with sharp uneasy struggles, create such a sensation and whirl as only a run of three-quarters of a mile down the timber shoots of the Ottawa can give. Once below these falls, the raft is re-made for the last time, and gladly do the hardy lumberers glide down the river with their timber safe and sound: not that all danger is past, for miles and miles of rapids, although not so steep, have still to be gone over, and the great Victoria Bridge at Montreal has to be shot through, where recently a raft was dashed to pieces on one of its piers, but almost by a miracle all the hands were saved, two by clinging to the pier, and the others to portions of the broken raft. Thus, often five months after the timber left the woods, it reaches Quebec, where, for miles on either shore above and below the city, the rafts are stowed away in coves prepared for their reception. When the lumberer gets his price, the merchant measures and classes the timber, and should any dispute arise, the Government sends a culler, whose expenses have to be paid by the party he decides against. The ends of the timber, which, to avoid damage to it, were left pointed, are now neatly squared, and hundreds get employment to put it on shipboard. The lumberers, like sailors after a long voyage, receive their clearance, and, very like them, rest awhile to spend it before they go back to the forest to begin again. The saw-logs either descend the falls singly without a slide, or are passed down after the descent of the cribs on to the large open reaches, where they are enclosed by booms, and towed *en masse* to the head of the next falls: these operations are repeated until the point of manufacture is reached. Above 1,000,000,000 ft. board measure are manufactured by the mills of Canada, valued at 10,000,000 dollars. More than one-half of this amount is turned out from the mills on the Ottawa river. In this city and its neighbourhood there are twelve large mills, all substantial and well-arranged structures, fitted up with the newest and best machinery, some of which will cut 150,000 logs each season, and turn out 150,000 ft. of lumber a day, with seven gangs, comprising 175 saws, besides edgers and butters. E. B. Eddy, a Yankee, who came here without a cent in his pocket, has, in addition to three saw-mills, a pail factory and a match factory, that the smallest piece of wood may not go to waste, where he employs 1,000 men and boys, women, and girls. Canada may well feel proud of the development of this trade, which has tended so much to increase her wealth, and to the cultivation of her soil, while it has administered to the wants of older countries, and made homes for some of their surplus populations.

Ottawa. THOS. CONNOLLY, Stonemason.

YEOVIL, WAKE UP!

A SLOWLY-IMPROVING, yet somewhat busy, town is that of Yeovil. It is pleasantly situated on the Ivel, or Yeo, and it possesses an archæological interest that compensates for some of its modern drawbacks.

The town knew some civil strife during the Parliamentary wars, and Fairfax, who did goodly work for Cromwell, left memories behind him here and on through to Langport. The fine old church, which passed almost unscathed, presents more of a weather-worn than a war-worn appearance, and it still exhibits much of its whilom splendour. We need not describe it in detail. It is a cruciform structure, in the Perpendicular style, with nave, transepts, aisles, chancel, porch, a fine tower arch, and a well-preserved cradle roof. The roof, which was once covered over with a plaster coating, was bared of its later coating during a late restoration, scraped, and varnished. The crypt underneath the chancel is worth a view, and the canopied doorway evidences skilful treatment. The modern stained glass in the church is what some call rich in colour; but the artistic manipulation is not above criticism, not even excepting that in the tower to the memory of Prince Albert. The ancient font and brass lectern will claim passing notice, and the questionable Latin inscription on the latter may create a smile. The gift of Martin Forester is, however, hallowed by time. Some monumental brasses are scattered about, in memory of local families, some dating from 1519; and there are a few quaint epitaphs. We mounted the tower in quest of undiscovered waifs, and we spent some time in deciphering the legends on the old peal of eight bells. The scrutiny turned out a rather tedious one, and not having sufficient time on our hands to twist ourselves through the old framework in the glimmering light we were afforded, we desisted. Two of the bells we examined bear the respective dates of 1626 and 1728.

The clock, which for many years never kept good time, was lately removed for repair. We have not heard that its new movements are more to be depended upon, but we have little doubt that the clock is fast enough for the motions of the present town council in office.

Of the modern churches, that in Peter-street, called Trinity Church, is the only one worthy of honourable mention. It is from a design by Mr. Benjamin Ferrey, in the Early English style.

The architecture of the modern public buildings in the town is mediocre. The town-hall is a somewhat large structure in the Ionic style, with a clock turret, underneath which is the corn exchange and market.

Here and there, through the older portions of the town, may be noticed some very old inns or hostelries, that have long since forgotten the names of their builders, hoary with age, and stoutly struggling against the blasts of time. Here are roofs that never knew of a ridge-board, but were lapped in a dowel unity; windows whose transoms and mullions were shattered, perhaps, under the shot and shell of Fairfax. Yet they live, as it were, defying time.

These old houses, with their projecting windows, heavy gables, long inward passages, curious wainscoted apartments, oaken stairs, lead the mind back to days when curious habits of domestic life and observances dovetailed themselves into the framework of English society, which squared itself with inward thought and outward actions. The Castle Inn and the George Inn may be instanced as specimens of that class of dwellings which are now fast disappearing from the land.

Leaving the past and its memories, let us touch upon the present and its duties. One

want of Yeovil is a good and effective water supply. The present supply is bad, nor is the water of that purity that can be recommended. Sickness was lately prevalent to a large extent. Cases of fever, scarlatina, measles, and other cognate diseases, were prevalent during last spring and summer, and one medical practitioner in the town informed us that he wondered the mortality was not greater. The drainage of Yeovil is very defective; indeed, so far as we examined, we saw the surface drainage finding its ordinary outlet (or perhaps inlet) through the common sinks and traps where it could, taking the rake of the road to some lower level, to be absorbed on its passage wherever it listed. The greater portion of the ordinary sewage is buried in the subsoil; the rest oozes and wriggles riverward. The whole of the sewage matter of Yeovil could be well and profitably utilised, and there exist natural facilities and inducements that ought to urge the local Board to stir in the matter.

The River Yeo is not in a very pure state, it may be guessed. Kid-glove manufacture is carried on extensively in the town and environs, and a large female population, and in many instances whole families, find employment in this local trade. The refuse-matter in connexion with these foci of industry is an item in any consideration of the subject. Sufficient nastiness, in all reason, we could see on all sides, finding its outlet in one way or another into the river. Will the local Board take a hint, and bestir themselves? There is talk of a new Bill for a better water supply. A Bill was once sent before Parliament, but fell through. The idea or plan now recommended is to bring the water from Evershot hills farther south.

The state of the Yeovil workhouse for a long time has been a chronic scandal. We have not space at present to go into detail, but we are safe in asserting that able-bodied youths have been kept for several years in the house, lazily squandering their time from youth to manhood, and at last thrown out upon society, unable to follow any useful occupation. They have been reared up to criminality; we have data to show it. The infant children, it is asserted, have been neglected by their nurses to death, and the old and infirm left for weeks in dirt without a change of clothing. Large quantities of wine, spirits, and beer have been put down to workhouse expenses, and we should like to be informed by the medical officer, who gives us the quantities, who are the consumers. It is heartless work to order stimulants for aged and infantile starvelings, without the certainty that they will reach those who pine and die for the lack of them. Taking the words of a late visiting committee, we are fortified in our remarks; for they stated to the Board that the union was in a disgraceful condition. In the matter of food, drink, and clothing, there has been great neglect, and there has also been a shameful expenditure for articles by which the poor patients have not benefited.

We repeat, and we challenge denial, that the children in Yeovil poorhouse have been hencooped and suffocated for want of exercise and air, and that their nurses and the guardians can scarcely be exonerated.

Yeovil is not the only workhouse south where reforms are needed. We have visited a few of them, and we could state facts that might startle the stoutest. If the Poor-law Board desire to effect a reform, we will help it out in the Christian endeavour, and give it and the public pictures of neglected life which vegetates in the land and threatens the future.

A few words more about the town proper. Yeovil is well served with railway accommodation. The South-Western and Great Western have both stations in the town. In the matter of new buildings, we perceived very little indeed in the town or environs. If some new dwellings were erected, a few of the old ruinous edifices of the town could be taken down with advantage. The town council have an opportunity presented to them for carrying out the improving powers with which they are invested but seldom exercise. It is very easy to know by the state of a street, the character of the dwellings that flank it. In Back-street, Park-street, South-street, Vicarage-street, and others, and the lanes and courts branching off, the local authorities would find ample and useful work to do in street paths, yards, channels, and drains. Down in that sluggish hollow, beside the old buttressed wall of the church, there is plenty of work for pavior, scavenger, and drain-maker.

Branching off from this quarter, there are zigzag places, dolorous-looking, rife with odours and rheumatics. Decay is here, within a stone's throw of the fine old "Lantern of the West." But are not some of our grandest Gothic cathedrals and churches encompassed by reeking shambles, and hidden from a proper sight by winding cut-throat kennels and equivocal domiciles? It ought surely to be the pride of the burgesses, citizens, and inhabitants of any town which possesses an heirloom of architecture, to preserve it, and glory in the possession; and it is also the duty of the local authorities of such towns where such glorious remains exist, to keep the spaces around them open, and render their approaches easy, wide, and ornamental.

There is a field called "The Park" outside the town, but it is merely a green sward, and we hear it is intended for building purposes: so the townsfolk must not indulge in dreams yet awhile of nicely-gravelled walks, fountains, ponds, lakes, or lovers' seats.

The cemetery is tastefully laid out with good approaches, and respectable chapels for burial purposes.

Looking back and looking forward, we are inclined to believe that Yeovil is destined to improve, although she has made but slow progress. Though possessed once of a local manufacture of woollens, in addition to her present glove trade, she need not lament its decay, while she has still resources undeveloped.

In the matter of intellectual enjoyment, the town boasts of a Mutual Improvement Society; but, though useful, its scope is but very circumscribed at present. If it would effect tangible and lasting good, it must widen its range, and not be content with mere readings, odd lectures, and intermittent entertainments.

There is wealth in the town and surrounding country, and a more ambitious effort is required for the rising generation than what we could hear of on our visit. Our parting advice to the local authorities is to do their common duties, vestrymen, churchwardens, poor-law guardians, and others. The first and most necessary step, let us repeat, is the purification of town and river, giving health by good drainage, securing a proper supply of pure water, attending more to the wants of the poor, placing the streets and footways in a better state of repair, and remodelling the poorhouse system, which is a disgrace to all concerned.

There is capacity enough to do these things rightly in this Somersetshire town; but with a little purse-proud intolerance and ignorance on the one side, and petty huxtering views on the other, the town is crushed, and its public spirit, except on rare occasions, is weak, fitful, and unproductive.

FROM FLORENCE.

Fortune seems to have adopted Italy as her favoured child, and is not wearied in heaping honours on her. Close on the long ardently-wished-for occupation of Rome, has come the offer of the crown of Spain to one of her sons. The deputation from Spain, consisting of the *élite* of her honourable men (after a quarantine of three days outside the harbour of Genoa), arrived on the 3rd, at Florence.

From the station to the hotel, prepared for their reception, the way was lined with infantry, cavalry, and National Guard. The streets were elegantly decorated with alternate Spanish and Italian flags, evergreens, and flowers in abundance. The deputation and suite consisted of 139 persons. The Italians thronged to see them, strangers also, and the *vivas*, which did not burst forth till they had reached their hotel, were loud and hearty. The Spaniards returned the compliment from their balcony, with repeated *Viva l'Italia*. On Sunday, the 4th, the presentation to the king took place, at which the request to offer the crown of Spain to the Duke d'Aosta, was made to the king by Ruiz Zorilla, the head of the deputation, and after a long complimentary speech in Spanish, and the acceptation announced by sound of cannon, the crown was given to the young prince, who was saluted as "Amadeo I. Re di Spagna."

On Monday, the deputation were at the opening of the Parliament, when the first Roman deputies were present. After being *fêted* by the king and municipality, and *fêting* the latter and all the diplomatic circle in return, they go back to Spain. The young king will not take up his residence in Madrid, it is said, until the middle of January, when his queen, whom all concur in pronouncing a clever and promising helpmate in the difficult task to be undertaken, will accompany him. May both be enabled to render to the long ill-governed country effectual aid in the progress and amelioration of everything it so much needs.

Florence.

MONT CENIS.

Our correspondent on the spot tells us it is announced now that 113 mètres only are wanting to be pierced to complete the tunnel, and that on the 28th ult. the workmen declared they could hear distinctly the noise of the working on the opposite side. The passing of our Indian mail by the Brindisi route has given the highest satisfaction to the Italians. It is to be hoped the benefit of the Mont Cenis Tunnel, after its completion, may not be long delayed in its realisation.

METROPOLITAN STREETS AND RAILROADS.

The opening up of new streets, the removal of street obstructions, and the widening of the throats of the thoroughfares of London, are works which make slow progress. Our metropolis has never hitherto been Haussmannised, and is not likely to be. Our Thwaiteses, Layards, and Ayrtons, are not under compulsion, either to execute great public improvements as speedily as the poor fugitive baron, or compelled to decamp as summarily as that active official did when the collapse came.

Londoners have not occasion to say, however, that the authorities are oblivious to public needs, or inactive in improving our means of communication. The corporation of the city of London have been, and are gradually, doing great things, in the improvement of thoroughfares, in some instances in the City proper, as directed by their engineer, Mr. W. Haywood, and in others in conjunction with the Metropolitan Board of Works. Among the street improvements in the City, either already effected or in progress, may be mentioned the widening of the eastern ends of Leadenhall and Fenchurch streets; the widening of Newgate, Upper Thames, and Mansion House streets; and of the Poultry and Ludgate-hill; of Gracechurch-street in the centre, and of Lombard-street at the east end, and Fenchurch-street at the west end, with gradual widening and improvement of Basinghall-street, Lime-street, Liverpool-street, Threadneedle-street, Throgmorton-street, Seething-lane, and Tokenhouse-yard. All these improvements are not yet accomplished facts, and we may need to exercise the philosophy implied in the proverb of Erasmus, *Festina lente*, but visible progress is being made of a very satisfactory character. The Middle-row of Holborn has been removed, the Holborn Viaduct has been completed, and spacious interjacent streets have been opened, or are in progress, in its vicinity.

The Metropolitan Board of Works, exercising its own powers in some cases, and acting in concert with the Corporation of the City, in others, has also effected great thoroughfare improvements of late, as witness the Victoria Embankment, and its continuation *viâ* Queen Victoria-street, to the Mansion House, with the communications open, or in progress, between the Embankment and Whitehall, and the Strand by way of Villiers and other streets. The completion and opening within the last two years of the new Blackfriars Bridge, the Holborn Viaduct, and the Victoria Embankment, are enough to repel the charge, against the public bodies concerned, of either "masterly inactivity" or supineness.

In connexion with this subject it is gratifying to notice among the schemes for which Parliamentary sanction is to be asked in the ensuing session, one that involves street improvements of an important character; we refer to the Euston, St. Pancras, and Charing-cross Railway Bill. Mr. John Hawkshaw, C.E., F.R.S., and Mr. J. Wolfe Barry, C.E., are the joint engineers of this scheme, which is a revival, in an enlarged and amended form, of a scheme for which an Act was obtained some five or six years ago, but which was burthened with costly and cumbrous provisions, and was not carried into effect. The connexion of the great railway systems having their termini on the north of London with those on the south, has long been an object of desire, and various schemes have been proposed in successive sessions of Parliament to connect Charing-cross terminus with northern lines. The cardinal points of the scheme now proposed are, the con-

nexion of the Midland and the London and North-Western lines, with the South-Eastern system at Charing-cross. The junction with the Midland system, it is proposed, will be with the low-level line which passes under St. Pancras Station. The line, passing thence eastwards, will be joined by two spurs thrown off from the extreme east and west arrival platforms of the London and North-Western Station at Euston. There will be, of course, interchange stations at St. Pancras and Euston, and an exchange station with the Metropolitan at Gower-street. The new line, it is proposed, will pass under the Metropolitan in Euston-road, and bending round to the westward, will be carried behind the houses on the west side of Tottenham-court-road, with stations at Goodge-street and at the junction of Tottenham-court-road with Oxford-street. From this point—Oxford-street—it is contemplated to effect an important above-ground improvement, in a 60 ft. street, from Oxford-street to Leicester-square, where there will be another station. From the south-east corner of Leicester-square to the back of the National Gallery another 60 ft. street will be opened up; the new National Gallery will have one 60 ft. street along the back of the new buildings, and, in accordance with the plans of Mr. E. M. Barry, another, passing along the west end of the buildings from Pall-mall East into Leicester-square, a line first marked out in our pages. This street will afford scope for architectural effects, and in conjunction with the other proposed new streets, will give a clear unobstructed run from Pall-mall, Westminster, and Charing-cross, to the North of London. The proposed railway will be carried under the two new streets first referred to, and it is believed that the Metropolitan Board of Works will bear half the expense of making such streets. With the street to the west of the new National Gallery the promoters of the Railway Bill have nothing to do. The plans lodged by the Metropolitan Board for the improvement of Leicester-square refer to the laying out of the space within the rails as an ornamental garden.

Reverting to the proposed railway, it will bend round by the north of St. Martin's Church, and, crossing under the Strand, pass the east side of Villiers-street, which it will cross diagonally, and run into the Charing-cross line, on the level, at the north end of the viaduct. There will be an exchange station on the north side of the Strand, a few yards to the east of the entrance to the present Charing-cross Station.

The proposed line will be almost entirely underground; but all the stations will be open to the upper air, and open shafts will be provided at suitable intervals for light and ventilation.

As regards the probable traffic on such a line as that contemplated, it can scarcely be doubted that it will be of a remunerative character. That the Boards of the London and North-Western and the South-Eastern Companies think so, is manifest from the fact that, in connexion with the North-Western and Charing-cross line before referred to, for which an Act was obtained, but the powers allowed to lapse, these companies guaranteed a dividend of 5 per cent. on the cost of construction. Since that time there is an opportunity of which advantage is to be taken, of connecting the Midland, as well as the London and North-Western, with the South-Eastern system at Charing-cross. It should also be mentioned that the Great Eastern will be brought into connexion, as trains of that company now run to St. Pancras station. The provision of another station at Charing-cross would also greatly relieve the present station, and afford room for 150 additional trains, or more, daily, from the South-Western and the Brighton systems. A large interchange traffic would be done by the connected lines, and it can scarcely be doubted that direct railway communication between north and south, across the heart of the metropolis, would command a heavy omnibus traffic. At present there are street omnibuses plying, along St. Martin's-lane and Tottenham-court-road, at intervals of less than two minutes, for above fifteen hours a day. The proposed line would set at rest, finally, in all probability, the often-mooted project of a direct east and west London line. This important project is launched under good auspices, and seems well fitted to secure the favourable regard of the Legislature.

Another project, of a different character, in the City proper, is exciting a considerable degree of interest, and, in so far as is known at present, will be unopposed. We refer to the Holborn Viaduct Station. This is a scheme for a terminal station, on a level with the Viaduct, to be situated between Farringdon-street and the Old Bailey. The frontage to the Viaduct would afford scope for an effective, but not necessarily very costly façade; and the area available, it is asserted, would give room for nine or ten lines of rail, and seven or eight departure and arrival platforms, with space for booking offices, waiting-rooms, luggage registration offices, and the other necessary conveniences. The space at command is of triangular form, and contains above 3 acres. The longest side of the triangle is on the Farringdon-street side; the next in length, on the Old Bailey side; and the shortest, the front to the Viaduct. The apex of the triangle reaches nearly to Ludgate-hill. The Ludgate Station of the London, Chatham, and Dover line is, we believe, quite inadequate to the accommodation of the traffic that might otherwise be brought to it, from that system and from the lines of the Brighton and the South-Western Companies. It has been designed for a passing station and through traffic, and not for a terminus, for which additional sidings and platform accommodation are essential. In the event of this station being constructed, it will be possible for passengers to enter on the street level, register their baggage at the station, and proceed to Paris, without further trouble on account of their luggage; this is assuming, of course, that Paris is again to become a place of resort, and that the delicate *grenouille* is to supplant cats and rats in the *menu* at the restaurants of the now distressed city.

Yet another scheme affecting metropolitan locomotion is of a totally different character from those referred to; it is for a communication by railway between Cannon-street and Broad-street stations. This scheme is engineered by Mr. Rammell, and is intended to be worked on the pneumatic system. This will not, of course, admit of working junctions with the lines at Broad-street and Cannon-street, but interchange stations at these termini, and a connecting line, would probably command a large traffic both locally, from point to point, and from the South-Eastern to the London and North-Western and North London lines, and *vice versâ*. Mr. Rammell demonstrated the practicability of his system on the experimental line he built a few years since, and worked in the grounds of the Crystal Palace at Sydenham. His loaded carriage traversed an unnecessarily severe gradient of 1 in 18, which is much stiffer, it may be presumed, than anything that can ever be necessitated in actual working. This scheme would have the advantage, as regards cost, that it would be unnecessary to purchase property, excepting for stations, shafts, and engine-house. The gradients might be regulated by the engineer.

Among other new railway schemes to facilitate metropolitan locomotion are the Eastern Metropolitan, and the Fulham, Hammersmith, and City lines, revived from last session; the Harrow, Edgware, and London; and a few others.

The plans lodged for schemes, involving works to be promoted in next session, include thirty-four Bills for street and road tramways. Of these, eighteen relate to London, and embrace many of the principal thoroughfares. Of the streets and roads in the metropolis in which it is proposed to lay these lines, junctions, and sidings, it may truly be said that their name is legion; and, looking to the grasping demands for powers made by the intending petitioners, we venture to think that we may have too much of a good thing. The powers asked for are absurd, and in some instances disregard the essential conditions under which tramways are admissible in cities—long, straight, and wide streets.

AN INDIAN BURIAL.

THE Rajah Murahaga, of Kelapore, who died in Florence, on the 30th of last month, had scarcely reached his twentieth year. His great intelligence and promising character, coupled with his early death, have raised much interest in him. He was travelling for his improvement, and gave great hopes of becoming a useful potentate of the 600,000 people over whom he was to have reigned. He had been brought up at Bombay. Though very dark, he was a fine-looking young man, broad-chested, with singularly expressive and intelligent eyes.

The seeds of the fatal disease were sown while indulging to excess in the new pleasure of skating, at Innsbruck. The intense cold of the country rapidly increased the malady; and on arriving at Florence he was unable to rally.

Two English and two Italian physicians were in constant attendance. He had brought with him the most precious remedies prescribed by the medicos of his people—pulverised pearls and diamonds; and, while recognising those of the physicians around him, precautions as used in India were not neglected.

Domestic animals were kept near the invalid, to attract the malady from the patient and from those who were nursing him. These, according to Indian custom, should have been thrown out of window. This being forbidden, the attendants contented themselves with throwing them into a courtyard from an inconsiderable height.

In spite of remedies and the greatest care, the malady grew worse from day to day: the prince not being able to lie in bed, desired to be placed on the ground, his legs to be crossed; and there he died.

The aide-de-camp of the Prince, who spoke only English, with the assistance of the English ambassador, overcame the objections of the municipality, and obtained, after some little difficulties, their consent to have the funeral rites performed according to the Indian customs. These took place, an hour after midnight, at the end of the Cascine, by the side of the Arno, thus following the laws of Vishnu. The medical attendants, the head of the municipal police, and other civic authorities were present. The body, dressed in magnificent garments,—the head surrounded with a turban, adorned with the significative signs of the rank of the deceased, the great scarlet mantle, embroidered richly in gold relief, covering it; while the arms were adorned with bracelets, and the neck with a necklet of large pearls,—was borne surrounded by his attendants, in an omnibus to the Cascene. There, in spite of precautions, were assembled crowds of people, including many ladies. The pile prepared was about 2 yards long by 4 ft. high and wide. A betel nut being put into the mouth of the deceased, a Brahmin began praying while manipulating a cake of dough. The Brahmin was clothed in a large linen mantle covering his head. The attendants sprinkled camphor and other perfumes over the pile. The body, carefully arranged, was placed on the pile, the plank on which it had been laid being removed from under it; and fresh perfumes added, the cake placed beside him, wood piled around him until he seemed encased, and bundles of wood placed high around. About two o'clock the whole was ignited in several places.

The plank on which the body had rested was thrown into the river. The Indians continued throwing incense on the pile, and keeping up the burning of the wood till nearly nine o'clock, when water was thrown on the embers. The remains were then religiously collected and placed in a porcelain vase. Every particle of the embers was thrown by two Indians into the river. They descended into the middle of the stream for the purpose. Earth was scattered over the place of the rite in the shape of a heart, around which small vases filled with rice were placed. All the Indians then knelt and prayed, their faces touching the earth. The urn containing the remains was carried away, to be later consigned to the Ganges. Many accessory ceremonies were dispensed with which would have been attended to had the deceased not died in a foreign land.

Florence.

SEWAGE IRRIGATION.

IN his elaborate and important paper on this subject read before the Maidstone Farmers' Club, Mr. J. Bailey Denton says:—

I propose to confine myself to that branch of the subject in the practicability of which the majority of persons concur,—I mean the treatment of sewage by *irrigation*; and I adopt this course because I believe that, with the exception of villages, public institutions, and isolated dwellings, in which excretal matter may, perhaps, be more suitably removed by a dry earth than by a water system, there is no other treatment open for adoption than irrigation, if we are to do as the Legislature will shortly compel us to do, *i.e.*, keep our streams free from pollution, and at the same time utilise the refuse of our towns in a profitable manner. I am led to this conclusion by the fact that, let the mode of treating excretal matter be what it may, it is not possible, if we are to have proper regard to sanitary arrangements, to avoid some system of underground sewage by which to get rid of the liquid refuse of towns. It is this conviction that is

already obliging even the northern "midden" towns, where to economise water for manufacturing uses, they resist the introduction of water-closets, to resort to irrigation as a means of purifying and utilising the liquid refuse from their sewers.

I hope that the cursory way in which I speak of the dry-earth system will not be interpreted into a condemnation of it. I have adopted it myself, and advise its adoption wherever it can be advantageously brought into use. There is one fact I wish here to mention with regard to the dry-earth system, and that is, that experience has shown that surface earth and clay will dedorise excrementitious matter, and that sand and chalk will not. This cannot but have a bearing when considering what are the most suitable soils for irrigation. It would be wrong, however, not to add that the Army Sanitary Commission in the report of the Madras Government, 1869, are reported to say that "the practical difficulty in the working of the dry-earth system, instead of decreasing with experience, has, on the contrary, increased to such an extent as to oblige the authorities to look to some other mode for the disposal of their refuse."

As far as experience has gone, the quantity of land required for irrigation will vary from the minimum of one acre to every 100 persons to the maximum of one acre to every fifty persons. With free soils, and a full recognition of the advantage of filtration in connexion with irrigation, one acre may suffice to cleanse the sewage from 150 persons, and under the same condition one acre of what are called retentive soils may equally suffice to cleanse the sewage of 100 persons. But these quantities must be enlarged for two reasons—first, because provision must be made for increasing population, and, next, because it is most desirable to have a margin of extra land beyond that which is absolutely required for purification in order to allow of an alternation of cropping, and an occasional rest of the land from sewage. Again, if the sewage is diluted above the standard I have mentioned, as it frequently will be, the farmer will desire to spread it over as wide an area as he can, and he should be provided with land to enable him to do so. If filtration is resorted to at times as a separate process (irrespective of irrigation), the area required may be reduced considerably. . . . .

It will have been understood from what I have already said, that I consider drainage, natural or artificial, a *sine qua non*, and that it should be so conducted in all cases, whether porous or heavy soils, as to secure active percolation down to the very base of the filter, by placing the drains sufficiently near to each other that there shall be no dead earth between them. The drains should be laid with special regard to the surface-carriers by which the sewage is delivered and distributed, and also, in some degree, to the shape and position of the lands or slopes over which the sewage will have to run. Where the drains must pass under carriers they should be made water-tight, and the surface should be prepared so as to prevent the collection of sewage directly over the drains under any circumstances whatever. The absorption of the sewage by the soil should depend upon the uniform porosity of the soil rather than any direct influence of the drains. In the case of a hospital in Surrey, where I have carried out the irrigation works with this point especially in view, the drains are so contrived that no sewage whatever runs over the surface immediately above the drains. The consequence has been that, although the liquid sewage of an average number of patients amounting to 235 daily has been crowded upon 1½ acre of land, the effluent water from the underdrains has been declared by Dr. W. Odling, F.R.S., to be "unexceptionable potable water." In this case the effluent water, when it reaches the level of the drains, mixes with a considerable quantity of subsoil water. The delivery of the sewage from a town to the land to be irrigated forms no part of the subject I have undertaken to speak upon. Before leaving the preparation of the land, I ought to state what, perhaps, I should have stated at the beginning, that the only mode of irrigation now generally acknowledged to be appropriate is that which distributes the sewage on the surface. The plan, however, adopted by Lord Essex, Mr. Mechi, and some few others, of showering the sewage by hose and jet (which is one mode of surface irrigation) is now objected to for three reasons; the first being that the expense is much greater; the second, that it is difficult to apply the sewage in sufficient quantities to saturate the soil while the service is attended with a loss by evaporation; and the next that it covers the stalks and surfaces of the vegetation with clinging sewage, which has been made a good deal of in consequence of its having been said, though without proof, that parasitic diseases are communicated by the deposit of sewage on plants consumed by cattle. The suggestions that have been made from time to time for subterranean irrigation, on the ground that the sewage may thus be taken to the roots of the plants, to rise up in the soil and saturate it to the surface, have been entirely discarded. A remark made by the late Lord Palmerston on the occasion I have referred to, when, to meet the objections of his tenants who demurred to the loss of their water meadows, it was proposed that the under-drains should be occasionally stopped up, and water let in to them from the River Test, explains the ground of objection. On consulting his lordship whether I should try the experiment, he stated, "You may do so to a very limited extent, and at my cost, but it is opposed to a ruling principle of cultivation. Every good gardener has now rejected the saucer to the flower-pot, because he will not have bottom water. He prefers supplying his plants with water from above, taking care that there is proper drainage below." I need not tell you the experiment was never tried.

THE NEW LAW COURTS.

It is satisfactory, after the long and not quite justifiable delay that has marked the progress, or rather the want of progress, in connexion with the New Courts of Justice, to know that there are at last symptoms of a commencement of the works. On Tuesday last formal notices were received by contractors, inviting tenders for the foundations of the new Courts, to be sent in to the office of the Board of Works, on or before December 28th, at one o'clock p.m.

ART-EDUCATION.

At the annual meeting of the Cardiff Schools of Science and Art, Mr. G. T. Clark (whose papers in our pages on English Castles will be remembered), delivered an effective address. We print part of it that more especially refers to architecture:—

Time would fail me, even were I capable of tracing out this natural law in the whole circle of the sciences, but I will follow in some detail one, the most striking of them, with the examples of which we are all familiar, and the rules of which are continually and very grossly violated under our eyes, and yet an art, success in which may be appreciated by almost any one—I mean architecture. The earliest European architects appear to have preserved in stone many of the features of the early timber houses of rude nations. Then, in Europe, sprang up by degrees the Doric order, so simple and so grand, though heavy and formal. From this proceeded the Ionic, and finally the Corinthian, in which the fulness of majesty is combined with a sufficiency of ornament. The plant had then reached maturity, and all beyond is decay;—decay, often indeed marked with grand features, but evinced by the debased proportions, the excess of ornament, the combination of dissimilar parts, the substitution of the arch for the lintel upon the column, a position for which it is, for mechanical reasons, entirely unsuited. Out of the very depth of this debasement, such as it prevailed in the late Roman empire and in the Roman provinces, as from the disorganised and mouldering remains of a forest, a new growth appeared. It arose rude but original in the midst, and to supply the wants of a rude but vigorous people. It arose with the dawn of modern civilisation—an architecture of a new and original kind, suited to countries which could not command the vast masses of marble which are essential to the classic orders, and under a climate which required the light of the sun, not, as before, to be excluded, but to be admitted as freely and through as many and as large openings as possible. Thus, by narrow and slow beginnings, arose the style generally known to us as Norman, from the energetic race who imported it into this country;—not unlike, in many respects, to the debased remains of the Roman work, but scarcely derived from it, so different is it in the obvious reliance of the architects upon their own resources, in the boldness and originality with which they introduced ornaments drawn from nature, or from their northern mythology, or from their own rude ideas of beauty. The Early Norman is no doubt rude and inelegant in design, but it is vigorous; not produced by imitation; and it belongs to a rising and not a debased period of art. Very gradual, but very instructive, are the steps by which this earliest style became exalted, by which the heavy masonry of the eleventh century expanded into the grand, though heavy, shafts, and lofty, though massive, semicircular arches, and those rich bands of reduplicate mouldings that produce so solemn an effect, and are still so much admired in cathedrals such as Durham and Gloucester, and constitute the perfection of the Norman style. To this succeeded, by a series of not unpleasing steps, the pointed arch, detached shaft, high-pitched vault, and flowered ornaments, whose elegance, slightly marked by stiffness, characterises the Early English style; that of Canterbury, Westminster, Salisbury, and the Temple, the beautiful window called the Five Sisters in the northern transept of York, and the unrivalled nine altars at Durham. During the Edwardian age the stiffness gradually, but wholly, disappeared; the monastic architects aspired to a lighter style. With a boldness peculiar to themselves, they threw vaults and arches of a loftier pitch and wider span. The narrow opening, with its circles and trefoils and formed geometrical tracery, gave way to those ampler windows and graceful flowing lines, the pride of Beverley, Carlisle, and York, and which still adorn many a rural chancel. The change descended into the details. The mouldings and friezes, with their fine contrasts of light and shade, of ivory and ebony, became bolder and more rich. Buttresses relieve the length of the wall, and the deep niche with its fretted canopy and sculptured saint took its place as a frequent ornament. The interiors are now enriched with grotesque corbels, highly-wrought pendants, and bosses; and those noble tombs were constructed whose shrines and tabernacle-work and their recumbent effigies are so beautiful and in such exquisite harmony with the buildings that contain them. To the Edwardian age are due the glorious west front of York, the far-famed lanthorn of Ely, the stately spire of Oxford, and almost the whole of those unequalled parish churches for which Lincolnshire is so deservedly celebrated. In an age which, if in some respects rude, was yet eminently original, arose those wonderful structures whose designs are so peculiarly English; whose magnitude is lost in the harmony of their proportions and the nice adjustment of their parts; whose vaults and circles are balanced with so much geometrical skill; whose details, alike in style, but differing widely in pattern, so exquisitely finished where least intended to be seen, remind us less of the works of art than of those of nature in their beauty and their profusion. If the production of that high and solemn frame of mind which, not itself devotional, forms yet no unfit preparation for religious offices, be regarded as the one great end of ecclesiastical architecture, those who designed our English cathedrals must be allowed to have been perfectly successful. The style of the first half of the fourteenth century is termed technically the Decorated. In the succeeding age were erected many fine buildings, such as the chapel of King's College, Cambridge, that of St. George at Windsor, and of Henry VII. at Westminster; but beautiful as those structures are allowed to be, they lack the graceful but grave simplicity of the preceding style, so pure in the conception of its designs, so free from all meretricious ornament in its details. In fact, with the perfection of the Decorated style, Mediæval architecture attained its maturity; and its decay, at first retarded, became rapid. The style of Henry VIII. and Elizabeth, technically the Tudor, produced many fine private houses, but nothing of a very original character, and the reign of the Royal pedant, James, himself an embodiment of bad taste, produced only a mixture of debased Mediæval and Classical details, jumbled together in a most tasteless manner. I have selected architecture as a convenient and complete instance of that natural growth, progress, and decay of which I have spoken. Why this should be so has never been satisfactorily explained. It has been said that the Reformation, by destroying the monastic orders, put an end to church building on a large scale, and that a style of architecture which had grown up for ecclesiastical buildings was unsuited to private dwellings. This is no doubt true, but the decay began long before the Reformation, and some of the finest and most costly Perpendicular churches and halls exhibit symptoms of it. The fact, however, remains, and all will allow that nothing original

and more beautiful is now likely to grow out of the Corinthian order, or to be superinduced upon the Decorated style. If architecture is again to rise, again to display itself in a third and original phase, it must be by the growth of a new era, not by the skilful imitation, or combination of the parts, of preceding styles. The introduction of a new material, iron, into constructive art, may possibly give rise to such a revival; but Crystal Palaces and gigantic railway stations and viaducts by land, and iron ships of prodigious dimensions by sea, exist in considerable numbers; and though many of these are marvels of mechanical skill, they have certainly not as yet established any eminence as works of genius or displays of the imaginative faculty. But if this be really so,—if it be true that the great efforts of the imagination, painting, poetry, architecture, and the other fine arts have risen, flourished, and died away, and even if resuscitated, could not be grafted so as to draw vital energy from the ancient stocks,—what, then, remains for those who live in this latter age of the world? Are we, who inherit the rich treasures of the past, whom the arts of printing, founding, and engraving, and the discovery of photography, have made familiar with the greatest works of ancient and modern times—are we to be content with that inheritance, and to make no attempt to turn it to account? If this be so, why promote schools of art, or encourage students to devote their lives to what cannot be in the highest sense a success? The answer to this melancholy conclusion is happily full, complete, and encouraging. Although, after the age of Velasquez in Spain, of Titian and Leonardo da Vinci in Italy, of Claude, Poussin, Rubens, and Rembrandt in France and the Netherlands, there was a period during which art, in almost all its branches, was in decay, and on the Continent, at the time of the French Revolution, had sunk very low indeed, there remained in each country, and especially in England, the germ of a new era. Vandyke, who, though not English, worked much in England, and had many followers there, degenerated into Kneller and Hudson, and there were days when Thornhill was thought a considerable painter; but at this lowest ebb appeared Hogarth, a painter of great originality and purely English genius, and the founder, if not of a noble yet of a very high style of art, and with or after whom came, in quick succession, Gainsborough, Wilson, and Reynolds, each, especially the first and last, impressing his works with the stamp of originality, each producing an effect never more visible or healthily recognised in British art than at this time, even when we have had, in Constable, and Turner, and Wilkie, artists equally great and equally original. In sculpture, our great names are less numerous and less original. Stone, master mason and architect to Charles II., was more than a mere carver; and Cibber has made himself a name by his famous statues of Frenzy and Melancholy Madness, in the hall of Bedlam. Roubiliac, Rysbraeck, and Scheemakers, though they worked in England, were not Englishmen; but Flaxman, though formed upon classic models, was undoubtedly a great sculptor, a distinction which cannot be withheld from Chantrey, and certainly will be conceded to Gibson. In the subordinate arts of engraving and wood-cutting, Woollet was intensely original; nor should Bewick be forgotten, even with the works of Gustave Doré fresh before us; and, in landscape engraving, Wallis and Miller, Goodall and Armytage, should be named. As a carver in wood, Grinling Gibbons is unrivalled for representations of still life. It is uncertain, however, whether he was by birth Dutch or English. He has left behind him also some statues of great merit both in marble and in metal. The English school of etching is of modern date, commencing probably with Turner and Wilkie. In architecture, absolute originality was perhaps impossible, and certainly not attained. Inigo Jones produced a style perfectly distinct from the expiring Mediæval, and which in its combinations of classical details was, in a certain sense, original. Wren, his great successor, was not only our greatest English architect, but the only architect we have produced who was also an engineer, a mathematician, and a scholar—the only architect who, in the grandeur of his conceptions, the purity of his style, and the accuracy of his mechanical skill, at all resembles those marvellous and many-sided artists to whom Italy gave birth. Wren, in his St. Paul's, has produced a building which, in all but the important accident of size, surpasses its great rival, St. Peter's, and with it divides the admiration of the Christian world. Wren left behind him Gibbs, the architect of the charming dome of the Ratcliff, at Oxford, and the superb church of St. Martin's-in-the-Fields. These alone showed in their day what could be done by the adaptation of Pagan materials to Christian art, as after them Chambers employed the same elements in the construction of the palace. Somerset House, the masterpiece of Chambers, is probably the finest palace in the world. Certainly its equal is not to be found in Rome or Venice, or even in Genoa, that City of Palaces. It is a palace worthy of the noble river of which its terrace is the chief ornament—of the great bridge, the masterpiece of Rennie, which seems to spring from under its shadow, and of that magnificent quay which alone is capable of redeeming the taste of our age and country.*

OPEN CENTRAL STREET: TOTTENHAM-COURT-ROAD TO CHARING-CROSS.

THE default of open thoroughfares across the ancient centre of London has long been an impediment to traffic, and an insurmountable obstacle to the improvement of those quarters, extending from west to east, between Regent-street and Farringdon-street, and from north to south, between Oxford-street and the line of the Strand, for a distance of nearly two miles.

When first laid out, and extra-mural, the mazy sinuosities of intercommunication throughout this range might have sufficed for the purposes of the time, but the unforeseen extension of the metropolis, in finely quadrated and open thoroughfares, has long since shown the necessity for direct traverse lines.

At present there are but three direct traverse routes,—Fetter-lane, Chancery-lane (which are close together), and St. Martin's-lane; unless to these be added Drury-lane, which runs in an oblique direction from north-west to south-east. Thus this, the heart's core of the metropolis, containing as it does some open squares — Lincoln's-inn-fields, Gardens, and Inns of Court,—has continued to be sealed up, and approached but by straits or turnstiles.

The new street lately projected in the *Builder*, leading in a right line from St. Clement's Danes, by the New Courts of Law, along the western side of Lincoln's-inn-fields, will redeem the character of this portion; making a nearly central aperture in a most important position. But the opening which is most needed for public traffic ought to tend from Tottenham-court-road, the great northern line of intercourse to Charing-cross, which may now be denominated the main centre of London.

This line would be within a point of north and south, and would nearly alignate with Whitehall, having the old abbey as its terminal object. Its beginning should be at St. Martin's Church, with a semicircus at Hemming's-row, opposite the National Gallery, continuing across St. Martin's-court and Cranbourne-street, just at the point where it is crossed by Castle-street, and thence in a right line to the south end of Crown-street. This would be a distance of only 500 yards. The range of four houses backed against the school-house and site for the enlargement of the National Gallery should be demolished, leaving that building open for architectural embellishment, and leaving St. Martin's-lane wholly intact; and here, perhaps, would be the heaviest expense of the undertaking. The continuation should be along Crown-street, which, being but a lane, ought to be widened to the extent of 70 ft. This street extends just 1,000 ft. to Oxford-street; and the increased value of surplus ground and buildings to be purchased would amply recoup the expenses incurred by the valuation and demolition of the old crazy tenements which now stand, at a minimum value.

At the Tottenham-court-road end a circus ought to be formed, equivalent, at least, to either Oxford or Piccadilly Circus; and the unsightly and obtrusive block of shops at the south end of Tottenham-court-road, although no essential portion of this plan, ought to be demolished. These shops have long restricted and degraded this fine open thoroughfare. Their abatement would lend a grandeur to the design; so that, with Meux's Brewery on one angle, the opening of High-street at its junction with New Oxford-street, and the open continuation of Oxford-street westward, would give a character to this concentric traverse circus which none of its precursors present.

The length of this entire traverse route would be only 2,500 ft. in all; and the length of the portion to be demolished and cut through the zigzags and windings of old purlieus is only 1,500 ft. Now that the Thames Embankment has been completed, new streets (such as Cranbourne, Farringdon, and Victoria) have been formed, Park-lane widened, and other improvements sanctioned, the inaptitude and defaults of the old City become the more palpable and intolerable.

From the energy and activity lately displayed by the Board of Works, there are hopes that London may vie with any other city in modern improvements; and, in fact, there is no other city in Europe possessing the advantages in situation which render it susceptible of the highest degree of embellishment.

St. Martin's-lane may be called a traverse street, and so it is; but its mean width is but 34 ft., and it leads only to Broad-street, and through the impoverished quarter of Seven Dials; and as to the meditated opening out of Berwick-street into Rupert-street, although it would certainly much improve the wretched courts, alleys, and lairs of St. Anne's district, this line, not being near the centre, would be of little public utility, more especially as Berwick-street is not 30 ft. wide in the mean. A leading thoroughfare, to be of any great public utility, should be concentric and straight, connecting large and populous districts, and it should be at least 60 ft., if not 70 ft., wide. Now, the line recommended would bisect in nearly equal parts the block behind Regent-street; and Farringdon-street, having issue from the great leading point of Tottenham-court-road, and exit into Trafalgar-square, between the National Gallery, St. Martin's Church, and Northumberland House, the continuation of the traffic diverging from either end into the most important and populous districts.

It is some years since the *Builder* sketched out the plan of Cranbourne-street, to permeate the hovels of St. Giles's. This has been carried out, as also that of Garrick-street, leading thence to Covent Garden. The completion of these thoroughfares has caused a thorough transformation in these quarters. The line of new street now recommended is quite as much needed in the ranges of Crown-street, and the vicinages intervening, as far as Cranbourn-street, which have stood for generations a sort of intermediate morbid corpus, accessible to everything but improvement.

Imbued with the prevailing spirit of metropolitan improvements, the Corporation of London is now actively engaged on the work; but the withdrawal, for only 20 ft., of a frontage such as Ludgate-hill or of Newgate-street will cost them more than the formation of Crown-street from end to end. It is to them that the population is indebted for the removal of Bars and the enlargement of the now grand Holborn route, as also for the fine viaduct over the former valley, as well as for Thames bridges *free from toll*.

Frequenters and *habitués* of London have ordinarily little conception of the width of streets; therefore we note down a few known thoroughfares:—Piccadilly varies from 70 ft. to 48 ft.; Regent-street is regular at 80 ft.; Fleet-street is in the mean 63 ft.; Temple Bar only 14 ft.; the strait of Victoria-street (Westminster), 72 ft. from house to house, and 60 ft. between the areas; Holborn varies from 65 ft. to 110 ft. at Furnival's-inn; Whitehall is 120 ft. from Parliament-street to the Admiralty, while the main central duct of the Strand is in the mean only 53 ft.; but Portland-place is 142 ft., and Westbourne-terrace, is even wider, with its inclosures.

From these data some inference may be drawn as to what the width of a great thoroughfare ought to be, and it may also be seen that the height of houses reduces the apparent width of the causeway; and, at the same time, the straight line, with perfect *uniformity of structural façade*, by no means improves the scenic effect of a street. In point of fact, Cannon-street, Moorgate-street, and King William-street, ranging from 60 ft. to 70 ft., afford ample scope for traffic, condensed as it often is here at its highest pressure.

* In the course of the proceedings, a presentation was made to Mr. Peter Price, the secretary of the Schools. Miss Pounce, as the representative of the students, handed to Mr. Price a handsome microscope, in case, and accompanying this was an illuminated address, executed by Mr. Edwin Seward, stating the occasion and the motives of the presentation. Miss Pounce was loudly cheered, as was also Mr. Clark when he read over the list of signatures to the address, and observed that the students appeared to have examined Mr. Price microscopically only to admire him the more.

In whatsoever light the question of a north and south street through this inert though central mass of the metropolis may be viewed, the paramount necessity for a leading thoroughfare cannot be long averted; and as soon as earnest measures are taken for its execution, the rent and value of its worst slums will increase, whilst improved facilities of commerce will enhance the value of outlying vicinages.

Q.

WEST LONDON SCHOOL OF ART.

The annual meeting for the distribution of prizes to the successful students of this school was held on the 8th inst., at the school, 204, Great Portland-street. Sir M. Digby Wyatt presided, and there was a large attendance of students and their friends. Mr. Stewart, the master, read the report, which stated that during the past year the number of students in attendance was 479, being nearly 100 more than in the previous year. The number of students had been steadily increasing, so that they now occupied the position of the sixth largest school in the kingdom. The success of the school in all competitions was also largely increasing. In 1869 the students of the school obtained forty-eight prizes of all kinds; in 1870, they obtained 112. The character of the work done in the school was also improving. One of their advanced students, Mr. James Rowley, had gained a South Kensington scholarship of 50*l.* a year.

The chairman said, that on looking over the statistics he found that this school was by far the largest in London, and it would be disgraceful if it were not, seeing that it was in the centre of the district in which the greatest interest was felt in the arts. The only school which offered a complete parallel to it was the Edinburgh school, which had 459 students; and in the rewards which were obtained from the Government, which was the best test after all, they were nearly equal, one school receiving 103*l.*, and the other 116*l.*; but when they came to the higher prizes, the Edinburgh school was far ahead of this. In comparison with other English schools, and particularly with that of Manchester, this school was far ahead; but the number of students in this school, instead of being nearly 500, ought to be 1,000. Unless there was progress they would not be able to stand competition, particularly against those foreigners who studied constantly and profoundly. He impressed upon the students the necessity of perseverance, and pointed out that it was a mistake to suppose that a few months' attendance at that or any other school would enable a workman to complete his education in art.

Mr. Donaldson (Gillow & Co.) addressed the meeting at some length, urging the necessity for art education, in regard to manufacturers, and, in the course of his observations, stated that one of the students of the school had been for some time past engaged in his own establishment, as a designer, and with such satisfaction to his employers that, as soon as the unhappy war was concluded, they intended to send him to Paris, at the expense of the firm, to improve himself in his art studies.

Mr. Peter Graham (treasurer) complained of the little support the school received from the manufacturers and others of the wealthy district in which it is situated. The list of annual subscribers was not what might be expected from the locality.

Mr. Crace and Mr. Hubert also addressed the meeting.

THE SANCHI TOPE.

Printed cards have just been issued by the Science and Art Department, inviting the public to a private view of the cast of the eastern gateway of the Sanchi Tope, recently erected in the South Kensington Museum. As, however, these cards contain, among other things, the startling announcement that this gateway was erected, B.C. 500, I hope you will allow me space to contradict a statement so utterly subversive of all that is known of the history of Indian art, before it has time to engrave itself, as a fact, on the mind of the public.

As long ago as 1843, in a paper I read to the Asiatic Society, I stated as the result of my investigations, that no stone monument of any kind or description existed in India which could be dated before the reign of Asoka, or B.C. 250. Since then no discovery, no argument has been brought forward to invalidate this conclusion, and it is now accepted as the starting-point of all inquiries.

There is no inscription, and no architectural feature which enables us to fix the date of the Sanchi Tope itself with precision; but, at all events, there is nothing to lead to the belief that it was erected before Asoka's time. The rail that surrounds it is generally admitted to have been erected at intervals during the 250 years that elapsed between Asoka's time and the Christian Crusade.

But General Cunningham, Colonel Maisey, and, so far as I know, every one who has written on the subject, are agreed that the gateways, of which this is one, were added to the rail in the first century after Christ. The inscription, the character of the art, the story of the sculptures—all tend so completely to form this conclusion, that it hardly seems open to dispute.

The four gateways are not, however, all of exactly the same age, and the eastern is certainly not the oldest. So far as I can make out its date may be from A.D. 50 to A.D. 75; and this is certainly near enough to its true age for all present purposes.

Jas. Fergusson.

SALE OF THE FARNESE PALACE.

We read in the *Opinione*, that on the 2nd of this month, a contract was agreed upon, by which the ex-Emperor Napoleon sold to the Italian Government the Farnese Gardens in Rome, with the Palace of the Cæsars, the museums, and objects of art found there, for the sum of 650,000 francs (26,000*l.*), adding an express desire that the excavations should be continued, and that Professor Rosa should be still retained to continue the superintendence of them. The agreement on the part of the Emperor was arranged by Signor Arese, one of the senators, and Professor Rosa, called in to witness the signing. The latter seeing the letter of his unfortunate friend, the ex-Emperor, became deeply moved. The deed was confirmed by Count Arese and Sella, the Minister of Finance. It is needless to add that the wishes of Napoleon will be scrupulously carried out.

THE STRENGTH OF SLATE.

With reference to the question of "A Mason" in last week's *Builder*, I may say that some years ago I had occasion to make some experiments on the strength of slate slabs, and I found the average results of a considerable number of experiments to be as follow:—

The lengths of bearing of the slabs varied from 2 ft. to 6 ft., the widths from 3 in. to 1 ft., the depths from 1 in. to 4 in.; and the co-efficient in the equation $w = \frac{c\,b\,d^2}{l}$ was found to be, for self-faced slabs 2·25, for slabs sawn in the line of the laminæ 2·, and for slabs sawn out of a block 1·, where

w = the breaking weight in cwts. applied in the centre,
l = the length of bearing in feet,
b = the breadth of the slab in inches,
d = the depth of the same in inches,
and c = the co-efficient above named.

What portion of the breaking weight ought to be taken as the safe load will depend on the nature of the load. I assumed one-fifth to be a safe load in the cases I have given, where the load was a quiescent one.

C. S.

ARCHITECTURAL EDUCATION.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the last meeting of the Institute (the 5th inst.), the President, Mr. T. H. Wyatt, in reference to a letter received from Mr. L. W. Ridge, honorary secretary of the Architectural Art Classes Committee, stated that the committee were still in want of funds to complete their undertaking, and that although the Institute had recently voted 50*l.* for the purpose, he trusted the members would not fail to give the scheme their individual support by private subscriptions.

Mr. A. Waterhouse, Fellow, as chairman of the committee, observed that additional expenses had lately been incurred by recent improvements in the accommodation provided for architectural art students at the Museum in Bowling-street, Westminster. To meet this expenditure donations to the extent of eighty guineas had been promised, but 70*l.* more were still required. Mr. Waterhouse added that four art classes had already been established under competent supervision, viz., for figure drawing, architectural ornament, perspective, and modelling. He trusted that Fellows of the Institute would interest themselves in the scheme by inducing their pupils to join these classes.

Mr. J. Hebb, associate, called attention to a work recently presented to the Institute, viz., a report compiled by the Institution of Civil Engineers on the Educational Statistics of that Profession (already reviewed in our pages), and suggested that the Council might consider whether it would not be desirable that a similar report should be issued by the Institute, on the subject of architectural education.

Professor Donaldson remarked that the matter had, in various forms, been frequently discussed. Inquiries had been made abroad, and much information had been obtained by the Institute before the present voluntary architectural examination scheme had been established. Some valuable suggestions to professional students as to their proper course of study, &c., would be found appended to the book of rules for the examination.

The President promised that Mr. Hebb's suggestion should receive the consideration of the Council.

BATHING IN THE DRINKING PLACE.

Sir, — Having just received a copy of the *Tunbridge Wells Journal*, of the 8th ult., in which are set forth the proceedings of the Improvement Commissioners, at their meeting of the 7th ult., I cannot refrain from sending you a copy of a letter received by them from the Tunbridge Wells Bathing Association. Being a native of this fashionable town (although absent for many years), I am aware of the many reputed valuable qualities of its waters, but it certainly never occurred to me that the town possessed commissioners of such a speculative turn of mind, that they should actually let their reservoirs for *bathing purposes*, "at a nominal rent." But such is the march of economy in the present day, that I can only imagine the Tunbridge Wells Commissioners as being desirous of leading the van; or possibly the members thereof, who are of a scientific turn of mind, have discovered some extraordinary and improved value in the medicinal effect of their local waters being applied cutaneously before being taken into the system.

Robert Collins.

A GLANCE AT PART OF EDINBURGH.*

The reconstruction of the Bank of Scotland is a success. What was once a clumsy, ill-proportioned blot upon the scene is now an imposing and attractive structure. But an advantage in one direction is often a disadvantage in another. The increased importance given to the dome diminishes the effect of the fine open crown of the tower of St. Giles's, as seen from some points of view. In passing, why are the Bank directors, after behaving so liberally, stopping short at the last pennyworth? The four statues, or groups, upon the pedestals of the loggia remain unexecuted, whereas groups are placed in positions where it is requisite to employ a telescope to see them.

Arrived at the head of the mound, how magnificent is the scene before us,—to the north-west, the castle on its rock, the gardens below bordered by the line of Princes-street, the tower of St. John's, the dome of St. George's, the towers and turrets of Donaldson's; the Orphans', Stewart's, and Fettes College, in the middle distance; and beyond, the wooded heights of Corstorphine and the glittering waters of the Forth. The only objectionable feature here is the bulky mass of St. Cuthbert's, lying at the western extremity of the gardens, a most unfortunate position for so ugly a building. May the pickaxe of the labourer some day soon erase it; if not, may fire destroy it. Turning to the north-east, we have the remaining half of the gardens in the foreground, with the Gothic canopy of the Scott monument on the terrace, the eastern half of Princes-street, the spire of St. Andrew's, the Melville column, the flat dome of the Register-house, the Calton Hill, with its monuments, the castellated prisons, the classic High School, and Burns's monument; Arthur's Seat, Salisbury Craigs, and again the waters of the Forth, out of which rises the island of Inch Keith, with its light-house; and closing the vista, the varied outline of the Lomonds. Often do I pass this spot, and seldom without pausing for a moment to admire.

Opinions differ as to the position of the Scott monument. So far as the monument itself is concerned, it is seen to advantage, but it is not

* From a paper by Mr. W. G. Shiells, read before the Edinburgh Architectural Association, on the 30th ult.

in keeping with the surroundings, and detracts from their importance. It is a building which would have been better placed in a square, surrounded by gabled houses, or else apart by itself in a park.

Let us now proceed up Bank-street. The houses to our right are old, and possess no architectural features. As the site is a valuable one, there is every probability that building operations will be in progress here ere long. If new buildings were carried out in a similar manner to the savings-bank and the adjoining building, the result would be a happy one; but the chances are rather against it. In continuing this thoroughfare southward, the back elevation of the County Buildings has been brought prominently into sight. For half a century this hideous deformity has stood unaltered; and it says little for the public spirit of our county magnates that such is the case. The glimpse down Victoria-street reveals a picturesque group of buildings, such as old Prout would have delighted in sketching. It is an example of how the picturesque in architecture is produced by the accidental combination of the works of different men. The formation of Chambers-street, and the completion of the Museum of Science and Art will give quite a new character to this neighbourhood. It must always be a subject of regret to us that the university was placed in the midst of a crowded locality. The want of a college-green is much felt. Had this building been erected on the north side of George-square, not only would the architectural effect have been fine, but the meadows would have been at hand as recreation-ground for the students. Such errors as this should be carefully guarded against in the future. The university authorities are, it is said, negotiating for the purchase of the old Infirmary, on the site of which it is proposed to erect additional college buildings; but, unless the row of shops between that site and the university is removed, the architectural effect cannot be satisfactory.

A new city poor-house has been built in the suburbs, and the old one is for sale. Here is an opportunity for doing something fine. It would form an excellent site for a town-hall, a building which Edinburgh is much in need of. To give proper effect to such a structure, the few buildings on the triangular space in front would have to be cleared away. Were this done, and Bristo-street widened southwards to St. Patrick-square, it would provide a useful and convenient thoroughfare to Newington and the south.

Had the Grange Cemetery been formed to the east or west of the ground it occupies, one of the finest avenues in Europe might have been made, as a continuation of the Meadow-walk, onward through the Grange estate, which is now covered with villas. This would have been a natural result involving no extra cost: it is an opportunity lost for want of foresight. It is a pity that Warrenden Park is being laid out in streets and terraces: the suburban character of the district will be disturbed; but I suppose it will pay better than if given off for villas. We have one item of consolation, however: the work is in good hands, and the elevations show a deviation from the stereotyped style, the sky-line being varied by the introduction of gables.

It is a remarkable fact that in this country we are very careless in regard to the accessories of our public buildings. Having erected an edifice of some importance, it is left without any attempt to combine it in an architectural manner with the ground upon which it stands. Those who have visited Paris will understand what I mean. As a notable example of the practice I refer to, I would call attention to the small place bounded by St. Giles's, the Signet Library, the County Buildings, and the High-street. The architects of the library and county buildings seem to have bestowed small thought on the levels. From the High-street to the library there is an inclined plane, which forms an awkward angle with the County Buildings. Now, I fancy that such a spot in Paris would have been treated somewhat after this manner; the ground would be excavated to a uniform level, a line of balustrades, with flights of steps at each end, would be formed to screen the sunk area from the High-street, and a parapet wall would take the place of the iron railings which do *not* screen the basement of the County Buildings. Probably a small garden or a fountain would adorn the centre, but that would be too much to expect here. Of course this arrangement would abolish the cab-stand, but the east side of the church would be equally convenient for cabby.

The newly-erected terraces at Dumbiedikes are very ugly. Here was an opportunity of producing a fine effect at small cost. You have something like the proper thing at the park end of Heriot Mount, and the fine mansion of Arthursley, designed by Mr. Lessels, is the right thing in the right place.

What city in the empire possesses a park like this? In parts you may fancy yourself far from the haunts of men, away amongst the mountains. A few trees introduced here and there would, in my opinion, add to its beauty, thick belts being used to screen off the gasworks and other unsightly erections, and small groups of two or three Scotch firs on this height, an elm and a pine on this knoll, half a dozen planes in that hollow.

Would it not be a mistake to place the Albert Memorial in this park? A group of statues here would look like intruders, giving an artificial character to a scene, the charm of which lies in its natural features. The proper place for such a monument is in the city, with architectural surroundings, and what more appropriate site could be found than in front of the Museum, the laying of the foundation-stone of which was the last public act of the Prince in Scotland. It would be seen to great advantage when the new and wide thoroughfare is opened from east to west, and would be in perfect harmony with the buildings surrounding it.

We shall now proceed, by way of York-place, to St. Andrew-square. As we turn up North St. Andrew-street we notice a valuable plot of ground lying waste. When the square was occupied as private dwelling-houses there was some sense in keeping an uninterrupted view to the north, but now the city has extended far beyond, and what was then an advantage is now an eyesore. It is surely worth while for the proprietors to enter into an agreement as to the disposal of this valuable site. The garden in the square has been much improved of late, and will assume an air of grandeur when the promised groups of statuary are placed at the angles, but they are "lang o' comin';" one was ordered several years ago, and at that time it was said to be modelled. Our sculptors cannot make the complaint, so frequently advanced by architects, of insufficient time being allowed them in which to mature their designs. This square might be another Forum were the buildings carried out in the style of the British Linen Company's Bank. It unfortunately is but a fragment, but the National Bank next door might carry out the design. This last bank has spent as much in tinkering up their premises as would have gone a considerable way towards carrying out such an enterprise.

There are few finer architectural vistas than that of George-street; its length and breadth are well balanced, but the majority of the buildings on either side are deficient in height and dignity, a defect which is gradually being remedied. The dome of St. George's forms an admirable termination; the position of St. Andrew's Church is, however, unfortunate: the eye looks for a spire on the opposite side, as this is one of the instances where balance is requisite, in order to the satisfaction of the artistic mind. The effect of this fine street has been somewhat marred by the grasping disposition of a few of the proprietors, who have thrust forward their buildings in advance of the others. It is singular that the exterior of the Assembly-rooms should be of the most dingy and forbidding description; a building set apart for gaiety and pleasure should surely wear a gay and inviting aspect. We are an austere people, it is said, and probably this was done with a purpose. (?)

Charlotte-square is, upon the whole, the best example of domestic city architecture we possess. There are an elegance and propriety, combined with a certain piquancy, about it which remind one of a gentleman of the old school. An attempt has been made to destroy the integrity of the design, and to convert some of the dwellings into warehouses. This, I am happy to see, has been vigorously opposed; but it is doubtful if our civic authorities have the power to frustrate the design. Should such be the case, it is time that additional and stronger powers were granted to them. It is monstrous that any one individual should have it in his power to destroy the architectural effect of a whole neighbourhood. St. George's Church is very disappointing, when seen close at hand. The side elevations are broken up in a stupid sort of way, and the detail is hard and insipid. The original design shows clock turrets flanking the dome. It is doubtful whether, if erected, they would add to the effect of the building, as seen from a distance; but this could be tested by the erection of wooden models, a course which might be more frequently followed.

Moray-place is too heavy and monumental, to my taste, as a place of residence. It is suggestive of cold pride and hauteur, not very agreeable qualities; but I can bear testimony to the fact that such is not the character of all the residents in that quarter.

Here we are on the Dean Bridge, a noble bridge, with light and graceful arches spanning a deep, rocky gorge, down which the turbid waters of the Leith flow. From here you see five of the stately educational establishments endowed by those emulous of the fame of George Heriot. One of these, the Fettes College, is just completed. In architectural embellishment it is the richest, and in general design one of the most successful, buildings we possess. It is not so dignified as Donaldson's, but far superior in detail. Close at hand are some of the newly-erected terraces: does not an inspection of them bear out my remarks as to the paucity of artistic ability displayed in the designs? Comfortable residences they doubtless are, but we, at least, look for something more. Trinity Church occupies a fine site. I would like to see another similar church (better in detail) on the other side of the roadway: the effect would be fine, whether seen from north or south. The remark has often been made that had the houses to the south-east faced northwards the effect would have been grand with the wooded slope in front; as it is, however, the back elevations are not unpleasing, and are gradually being enlivened by the introduction of balconies and oriels.

At the west end of Melville-street we are to have a cathedral. It is not often that such are built now, and, large as the fund is, it falls far short of that lately spent on the mere restoration of some of those erected in the Middle Ages; we cannot, therefore, expect to cope with them, but still, with the funds at command and an admirable site provided, we may reasonably look for the production of a church far superior to any other in the city; for, indeed, our ecclesiastical structures are nothing to boast of.

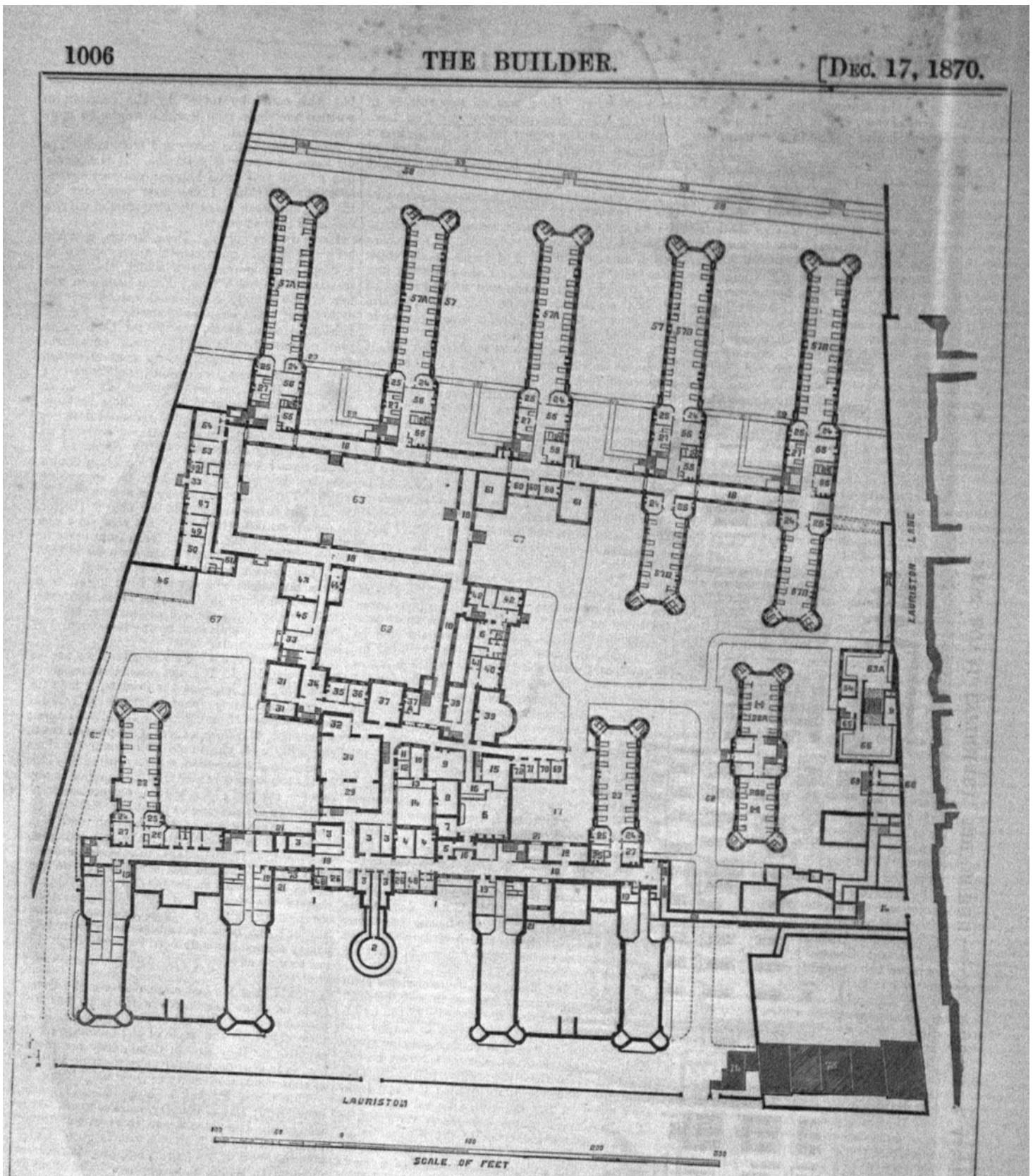
The levelling up of the Lothian-road is a decided improvement; to make it a complete success the thoroughfare should be widened onwards to Toll-cross, but we cannot go on here as did Haussmann in Paris. No one, I suppose, regrets the removal of the buildings which occupied the site of the Caledonian Railway Station; but it is to be regretted that a temporary station has only been built, although it is not so ugly as some permanent buildings of this kind.

Would that we had more citizens like Councillor Gowans. Look at the spirit he has displayed in the laying-out of Castle-terrace. You may object to the style of the buildings; but, peculiar as they are in detail, they are picturesque in outline, and far more pleasing to look at than the stale inanity of their neighbours.

The Grass Market is a quaint old place, wonderfully like a country market-town. This was hardly the place where to erect an Italian palazzo; the new Market-house is quite out of keeping, and is, moreover, inappropriate for the purpose to which it is applied. The effect is startling and far from pleasing, when, as you pass close to it, you see through the windows a ridge-and-furrow glass roof rising to less than half the height of the front elevation. Recent erections in this locality are in excellent keeping; indeed, if the improvements of the old town go on as they have lately, it will far surpass the new town in architectural interest.

During our ramble I might have called your attention to sanitary matters; but the subject is an unpleasant one, and I shall conclude by a general observation that, though much has been done, yet more is required of us. The main thoroughfares are well attended to; but some of the closes are in a sad state; and, what more intimately concerns you, the interiors of some of the *newly-erected* tenements are far from what they should be, having water-closets without means of external ventilation, and dark bedrooms in the centre of a block, which must be very unhealthy places in which to court repose. I know that this sort of thing *pays*; but do pray endeavour to use any influence you may possess with your employers to check such practices.

We are proud of our city; may we have still more reason to be so. It may be in the power of many of you to give material aid to its improvement. See that you do so in no careless spirit, but earnestly and to the best of your ability.

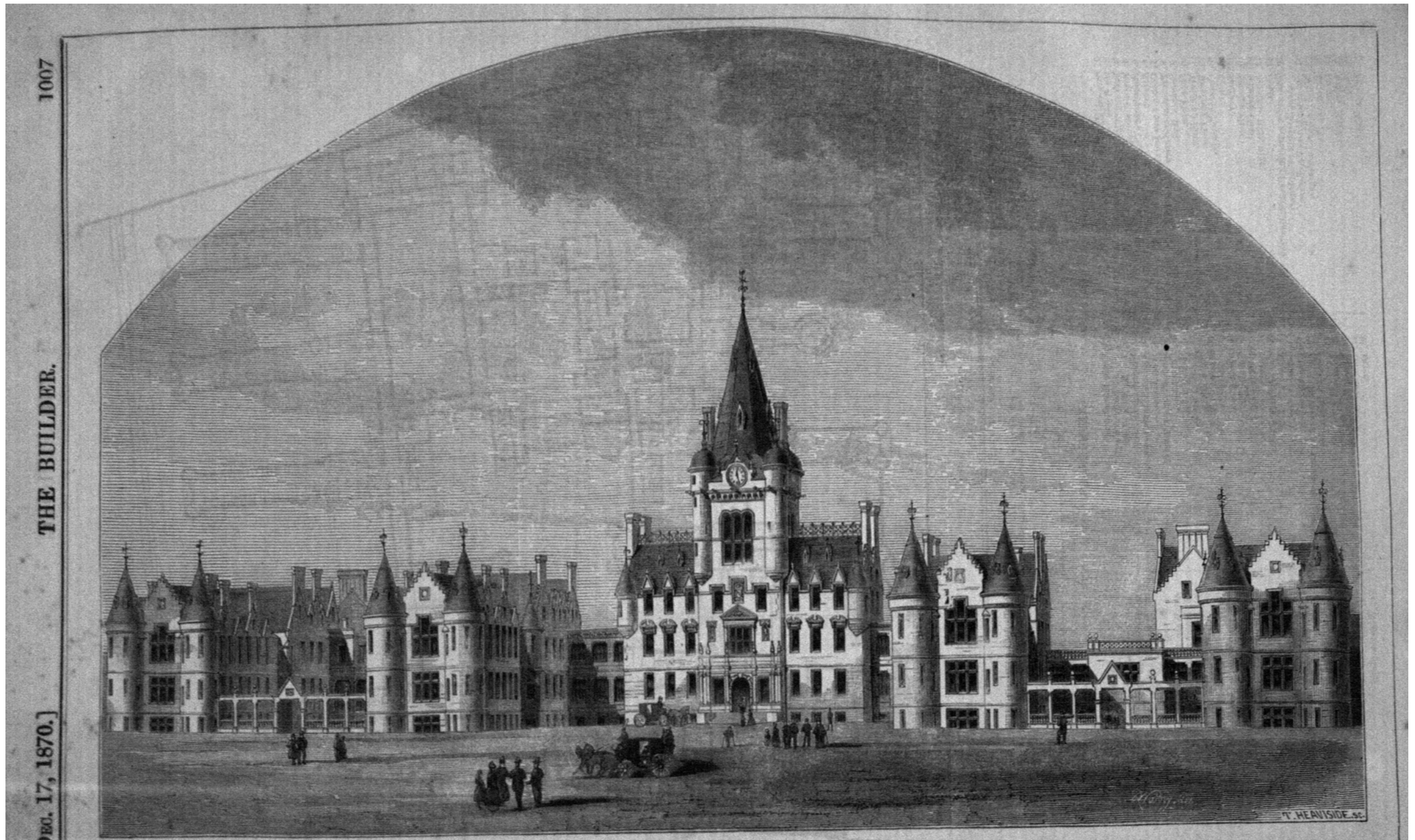


NEW ROYAL INFIRMARY, EDINBURGH.

Plan of Principal Ward Floor, Medical Hospital; and Basement Floor, Surgical Hospital.

REFERENCES.

1. Surgical Hospital.
2. Ice House.
3. Beer and Wine Cellars.
4. Porters' Rooms.
5. Housemaid's Closet.
6. Kitchen.
7. Cook's Store and Office.
8. Probationer Nurses' Dining Hall.
9. Servants' Hall.
10. Shoe Place.
11. Weighing Place.
12. Brushing Place.
13. Covered Passage.
14. Court.
15. Scullery.
16. Service Place.
17. Kitchen Court.
18. Corridor 12 ft. wide.
19. Coals.
20. Tunnel for conveying Dead Bodies from Surgical Hospital to Mortuary.
21. Space for Cross Ventilation.
22. Ward for Foul Discharges.
23. Erysipelas Ward.
24. Doctor.
25. Sisters, Nurses.
26. Bath.
27. Private Ward.
28. Fever Hospital:—
    A. Female Ward.
    B. Male Ward.
29. Nurses' Linen Store.
30. Patients' Linen Store.
31. Store Room.
32. Linen Store for Officers.
33. Entrance.
34. Hall.
35. Mending Room.
36. Work Room.
37. Matron's Office.
37A. Grocery.
38. Bread Store.
39. Nurses' Dining Room.
40. Matron's Dining Room.
41. Pantry.
42. Sick Students' Rooms.
43. Museum.
44. Curator's Room.
45. Preparing Room.
46. Covered Standing or Carriages.
47. Male Reception Room.
48. Lavatory.
49. Examination Room.
50. Female Reception Room.
51. Infectious Room.
52. Drive.
53. Out-door Patients' Waiting Room.
54. Dispensary.
55. Ward Kitchen.
56. Convalescent Room.
57. Medical Hospital:—
    A. Male Ward.
    B. Female Ward.
58. Walk.
59. Sloping Bank.
60. Wards. Special Cases.
61. Class Room.
62. Watson's Hospital Dress Ground.
62A. Underground Passage from Mortuary to Medical Hospital.
63. Garden or Dress Ground.
63A. Washing House.
64. Dirty Clothes.
65. Clean Linen.
66. Laundry House.
67. Gravel Space.
68. Upholsterer's Department.
69. Larder.
70. Milk Store.
71. Butter and Eggs.
72. Vegetables.
73. Area for Light.
74. Lodge.
75. Wharton-place.



NEW ROYAL INFIRMARY, EDINBURGH.—Mr. David Bryce, Architect.

NEW ROYAL INFIRMARY, EDINBURGH.

THE new Infirmary for Edinburgh, recently commenced, is being built from the designs of Mr. David Bryce, architect. The design is arranged upon the pavilion principle, and consists of Surgical and Medical Hospital, as well as of a separate Fever Hospital. We publish in our present issue an external view of the buildings, and a plan of the principal ward floor of the Medical Hospital, which also shows the basement floor of the Surgical Hospital. The wards are placed to stand south and north, so that the sun, in passing round them, will give a portion of its rays in turn to each side of the ward. The size of the wards, and the space between the pavilions, can be obtained from the plan.

The Surgical Hospital has sixteen wards, besides private wards, and contains 260 beds; being also provided with three reserved wards, containing forty-eight beds, the latter wards to be used when the ordinary wards require to be cleaned or vacated.

The Medical Hospital has fifteen wards, besides private wards, and contains 340 beds; being also provided with four reserved wards, containing 100 beds: thus making 600 beds in the two hospitals, exclusive of those in the reserved wards.

The Fever Hospital is designed to hold forty beds, in addition. Provision is also made for a pathological department, mortuary, washing-house, laundry, and workshops.

The Surgical Hospital is placed on the north portion of George Watson's Hospital grounds, facing Lauriston; the Medical Hospital is to the south of George Watson's Hospital, which will be retained for administrative purposes.

As from Lauriston-place, where the principal entrance to the Surgical Hospital will be, to the south end of the Medical Hospital there is a fall of no less than 35 ft., which includes a fall of 7 ft. immediately on entering, it becomes necessary that the floors of the three buildings,—viz., the Surgical Hospital, Watson's Hospital buildings, and the Medical Hospital,—should be on different levels. To obviate the difficulty occasioned by the difference of levels, as well as to connect the three buildings into one homogeneous arrangement, the principal floor of the Surgical Hospital will be raised as much above the level of the street at Lauriston as will afford proper height for a basement or ground-floor under the whole of the Surgical Hospital, which floor will be on the same level as the principal floor of George Watson's Hospital, and a few feet below the level of the second floor of the wards of the Medical Hospital. It is intended to raise a portion of the central court between the centre pavilions of the north front to the level of the street, so as to admit of carriages being driven up to the principal entrance door.

Close to the entrance are situated the principal staircase and board-room. The side flights of stair lead up to the second floor of the surgical wards, and the central flight leads, through a wide corridor with additional steps, down to the principal floor of Watson's Hospital, which will be appropriated to administrative purposes. From this level the second ward floor of the Medical Hospital will be reached on galleries formed on the roof of the piazza or corridor of the first story of wards of the Medical Hospital. Another flight of steps leads to the basement floor of Watson's Hospital, from which, by a piazza, the principal floor of the Medical Hospital will be arrived at. It is proposed to make the space enclosed by these corridors or piazzas, which is 140 ft. long by 80 ft. wide, into a garden, and to use the piazzas as exercising places for the patients.

A gate and lodge are to be at either end of the north front of the Surgical Hospital, entering from Lauriston. At the east gate, both patients and students will enter and descend by a road having about the same fall as the Meadow Walk, and leading to both Surgical and Medical Hospitals.

The entrance to the reception and examination rooms for surgical patients is situated below the east portion of the Surgical Hospital, and the reception and examination rooms for medical patients, are placed in a building, along which runs the piazza at the east end of the garden. On this, the basement floor of the Surgical Hospital, is placed the students' hall, situated between the two eastmost wards. By descending a flight of steps from the drive in front, the hall can be approached, as well as by entrance at the east end.

The nurse's apartment will be over the block of buildings at the end of each ward, and those of the probationer nurses in the upper part of the west wing over the chapel of the present Watson's Hospital. The present master's house in this hospital will be occupied by the officers of the establishment and students when sick, and the central portion by domestic servants, while the two upper stories of the east wing are intended to be the apartments of the resident surgeons and physicians. An immediate access from the Surgical Hospital to these apartments is obtained by a corridor beneath the gallery of the operating theatre, and from the Medical Hospital by a passage leading from the piazza. Electric bells from the various wards will be provided for these apartments.

The wards will be 28 ft. wide, and 15 ft. 6 in. high. The beds will be placed 9 ft. apart from centre to centre, having a window between them, and the fireplaces will be in the side walls of the wards. Each ward is provided with a private ward of two beds, having bath-room and water-closet attached, as well as a doctor's room, a sister's room, a ward kitchen, and a convalescent room, the corridor forming part of the latter apartment, an arrangement which will give direct light and air to the corridor. The wards are also provided with lifts for patients' food and coal, as well as dust-shoots, and closets for airing patients' linen, &c. At the end of each ward are placed two circular turrets, the one containing the water-closets and urinals, and the other the baths and lavatories, in both cases separated from the ward by passages 4 ft. 6 in. wide, with a window at either end for fresh air.

The main corridor, which is 12 ft. wide in each hospital, is continuous only on the principal and ground floors, and the windows are to be made so that they can be thrown almost entirely open. The arrangements will be such that each pavilion can be completely isolated, with a view to prevent infection from spreading. On the second floor of wards, the pavilions are connected by galleries formed on the roof of corridors. More free circulation of air is thus obtained, while the communication is preserved.

The Surgical Hospital is provided with two class-rooms and a great operating theatre. The Medical Hospital is also provided with two class-rooms. In both cases they are designed so that clinical lectures can be given; and they will accommodate about 130 students each. On the reserved floor of the Medical Hospital (which is below the principal floor) is placed a ward for the detention of noisy patients. The laboratory is placed on the ground-floor of the eastmost pavilion of the Medical Hospital, communicating with the dispensary, which is in the building at the east end of the garden. A ward is also formed in the upper story of the central block of the Surgical Hospital. Passages are provided in connexion with the long corridors in each hospital, for conveying bodies to the mortuary. The spare ground to the south of the Medical Hospital is to be laid out as pleasure-grounds.

The references to the one plan we are able to give will afford some additional information.

THE ROYAL ARSENAL SCIENCE CLASSES.

ON Wednesday night Prince Arthur was present at the distribution of prizes to the successful students connected with the Royal Arsenal Science classes. His Royal Highness presided, and distributed the prizes, and Professor Ruskin delivered an address appropriate to the occasion, in the course of which he touched upon the question of public education. He noticed that, independent of what the Government Education Act was likely to produce, there had already existed throughout the United Kingdom very extensive provisions for education; but he was sorry to have to acknowledge that those provisions had not been either faultlessly dispensed or wisely availed of. The great thing to be avoided was a bad education. There were at present all kinds of education. They may be classed, however, under two divisions,—viz., good and bad. He knew, from his own knowledge, that children of rich people, who could afford to pay the very highest price for instruction, received the very worst education, and the children of poor people often got the best education for nothing. What had to be decided was, where a good education could be had, and who were to be the teachers. As soon as this was well considered and decided, then, and then only, could they commence with good results the foundation of a valuable education. The professor cited a good many mythological and other stories, and drew from them good homely morals, which he recommended to his audience for their future guidance and happiness.

QUANTITIES AND TENDERS.

THESE much-discussed subjects require some still farther investigation. One correspondent thinks that builders ought not to have any voice in the nomination of quantity surveyors. I cannot agree with him as matters stand at present. A large number of the bills of quantities which come under my notice from time to time, are so erroneously described, or carelessly taken out, or, shall I say, executed by those of the profession who know but little how to take them, that I am not surprised that builders should claim the above privilege.

The difficulty would seemingly be avoided if the architect would select a thoroughly practical man to prepare the quantities, and ask such builders as were to tender for the works, if they had any objection to the person selected. I venture to assert they would undoubtedly reply in the negative, if they were satisfied that he was thoroughly practical and competent, and would deal fairly for both client and builder; or would, I prefer saying, take out the quantities exact.

Then comes the question, whom would the builder think a competent person? Certainly not the man who openly declares by publication that his quantities contain mistakes, or one that your correspondent says takes them out full; meaning, I suppose, one who would put down more than he finds. I take that to mean, that he does it for fear of being short in the total, in consequence of omitting other items which he knows not how to take properly. But the competent person, to my mind, is he who by a thorough practical knowledge of every item of labour and material required, can measure the exact amount, and no more or less, and can give a detailed description of every item that cannot be misunderstood. If such a person were selected by the architect to act between the client and builder, no objection, I believe, would be raised. But when we find quantities supplied, and the specification stating the builder is to make good any deficiency without payment beyond his contract, and at the same time he is necessitated to base his tender on the quantities supplied, which the very specification condemns,—it speaks very badly for the system. Unless, by the assistance of the architect, the practical and honest quantity surveyor is put in the aforesaid position, builders will still have cause to make complaint of injustice. This arrangement would put the quantity work into the hands of the best men that are now in the background, in many instances.

Then there is the wide tendering matter,—what is to be said of that? Errors sometimes occur in the estimates themselves; but there are these very unsatisfactory facts, which account for much of it.

Firstly. When quantities are not to be supplied for works about to be executed, one or two surveyors will endeavour to get the builders who are to compete to do so on their quantities, and, having gained the consent of one or two or more builders to estimate from their quantities, will take them out on that speculation. Not unfrequently, two sets are prepared for the same work, by different people, and the builders take them, some one and some the other, while a few will have nothing to do with either. It can be seen at once, if the quantities are not alike, one must be the highest, and the builder who prices them at a fair price has the largest amount of surveyor's expenses to add to swell up his amount, while another builder, who tenders from his own discretion, will endeavour to get the work at the lowest figure he can without losing; and, not having any surveyor's charges, &c., to add, he very naturally succeeds in getting low down the list, or perhaps at the bottom, while the amount of his unfortunate friend at the top appears to ask an absurd price.

Secondly. There is the fault of the architects asking a large number of builders to tender—twenty-five to thirty. Some of them, on finding out that fact, at once decide that the chance of getting the work is too small, and they therefore get a price from some other party, who puts them out of the reach of danger,

and the tendering is really not tendering, but a price is merely sent to prevent giving offence to the parties who have asked them. If a less number of tradesmen were put in competition, the results would be that tenders would be legitimate.

Thirdly, and lastly, there comes the patent fact of bad, or short, quantities, which get into the hands of builders not unfrequently. The difference not being discernible, or never looked after by many who estimate, they price them at their usual low prices, with the desire of success in getting the job; while the more careful estimator, seeing the loss which must be sure to come if he does the same, looks at the drawings, satisfies himself that he cannot put his usual prices, and, rather than get too low, he raises his price, feeling sure he will not get the job, and does not want to do so. Thus you have another wide difference produced. None of these differences, arising from such circumstances as these, can be much wondered at.

The right man in the right place builders would be glad, as a rule, to see; and there would then be a chance in such a state to bring credit again on the profession, which it seems, at the time being, to have lost, and of restoring that former confidence between builder, architect, and surveyor which one of your writers last week talked of. Until that time arrives, it appears to me that much that at present is bad will remain so.

JUSTITIA.

TRAFALGAR GRAVING DOCK, WOOLWICH.

SIR,—In your interesting review of the Autobiography of an Octogenarian Architect, the following curious statement occurs, no doubt arising from a *lapsus memoriæ* of the author of the book.

After referring to the failure of the graving dock (constructed of Ranger's concrete, south of the western tidal basin, at the extreme west end of Woolwich Dockyard), your article says,—

"Mr. Walker was called in, who prescribed granite for a first-class dock, but he ultimately took fright at the subterranean springs that had proved the masters of the concrete. The dock was abandoned, and a large basin only formed."

I accompanied Mr. Walker on the 10th of February, 1838 (on our way to Dover), when he inspected the concrete dock; and we were met by Sir Charles Adam, then First Lord, and Mr. Laing, the master shipwright.

We subsequently had numerous interviews with Mr. Laing, resulting in a cross section being adopted for the dock, parallel to the midship section of the *Trafalgar*, 120-gun ship, one of Mr. Laing's pet productions, and from which the dock, erected on the site of Ranger's Dock, took its name; for which I prepared the contract drawings, specifications, and estimates, and which was constructed by Messrs. Grissel & Peto, under contract for some 80,000*l*.

This dock, constructed within a coffer-dam, next the tidal basin, is 265 ft. in length, 80 ft. in width at coping level, and 26 ft. deep, formed entirely of granite, 3 ft. to 4 ft. thick, upon brickwork, in pozzuolano mortar, and backed up with concrete, the entire interior surface formed of a series of altars or steps, for strutting from up to the ship's sides, which are so graduated as to height as to be available as stairs for the workmen at any point of the dock, with one "broad altar" halfway up, and the sides are intersected by two timber slips, or plain channels, sunk through the altars, for letting down timber, &c., of such a width that they can be stepped over. At the head of the dock is a spacious staircase, of easier incline, bounded by two timber slips. The granite bottom of the dock is an inverted arch, the abutments being the superimposed side altar-walls, on a platform of brickwork, in pozzuolano mortar, which set so hard that in some alterations of level, in removing some of it, the bricks were more destructible than the mortar. The whole rested on a mass of concrete, 9 ft. deep in the solid Thames gravel ballast, the spring waters being conveyed away by a series of drainage-pipes to a deep pumping-well. The gate platform is of timber, on a mass of bearing-piles, all driven down to the gravel, with three rows of sheet piling.

The gates, 60 ft. wide, were at first proposed to be formed of oak; but, after due inquiry at all the royal dockyards, it was found no timber of sufficient length, scantling, and camber could be procured for the purpose, and cast iron was adopted for the heel and meeting posts and for the ribs, which were graduated in reference to the depth from high water, and the leaves of the gate were close-planked on each side. It was at first proposed to fit small pumps in the heel-posts, to get rid of the leakage. This, however, was found unnecessary, the whole of the work being so well put together by the contractors for this portion of the work, Messrs. Hunter & English, of Bow.

A large pumping-engine for emptying the dock was also erected.

Mr. Richard Townshend, who afterwards superintended the extensive works at Keyham Dockyard, was resident engineer. The present chairman of the Rivers Pollution Commission, General Sir William Denison, R.E., was in the yard at the time, constructing a granite dock, at the east end of the yard. Sir Morton Peto was also daily in the yard, superintending these and other massive constructions for the Government of the day. Either or all of these gentlemen would, I am sure, willingly substantiate the above.

This is one of those "fixtures" that could not well, in these days of retrenchment and dismantling, fall beneath the hammer of Messrs. Fuller & Horsey; and a fine water-colour drawing of the dock, seen from the gate platform, with the gates in course of erection, presented by the contractors, Messrs. Grissel & Peto, may be seen hanging in the library or reading-room of the Institution of Civil Engineers, 25, Great George-street, Westminster.

J. B. REDMAN.

CAUDEBEC LADY CHAPEL.

MR. COHEN notices (p. 943) a section of the vaulting of this chapel as being given in Gwilt's "Encyclopædia of Architecture," and wishes to learn from whence it was obtained. It occurs on p. 593 of my edition (1867) of that work, as taken from the supplement originally written by Mr. Gwilt. On p. 1012 of the same edition he will find a section and a plan of the chapel, in the essay on "Proportion," written by Mr. Cresy, for his "Encyclopædia of Civil Engineering." Both of these sections are reduced from that given in the valuable publication, Britton & Pugin's "Architectural Antiquities of Normandy," 4to., 1828, plate 64. The date of the nave, choir, and the chapels around it, is about 1426–56. G. Le Telier, who died in 1484, having been master of the works there for upwards of thirty years, may have designed it.

WYATT PAPWORTH.

THE BELLS AND QUARTER CHIMES OF THE NEW PALACE AT WESTMINSTER.

THE lofty eastern tower of the Houses of Parliament, or New Palace at Westminster, is furnished with a set of four chime-bells, a great hour-bell, and a clock, of which I will endeavour to give the most trustworthy account.

Before describing the present bells, however, I may remark that in the month of August, 1856, a great bell was cast from the design of Mr. E. B. Denison, Q.C., by Messrs. Warner, of Jewin-crescent. The following are the particulars:—Diameter at the mouth, 9 ft. 5½ in.; height, 7 ft. 10½ in.; thickness at sound bow, 9⅜ in.; weight, 15 tons 18 cwt. 2 qrs. 20 lb.; Note E. The weight of the clapper was 13 cwt. This bell, having been suspended under a massive frame of timber, erected for the purpose at the foot of the clock-tower, was called "Big Ben," in honour of Sir Benjamin Hall, then Chief Commissioner of the Government Board of Works. And every Saturday, at one o'clock, it was tolled for about half an hour. But at last, in October, 1857, "Big Ben the First" received a death-blow.

I now come to the present bells in the tower. The four chime-bells were cast by Messrs. Warner, in 1857–8. The following are their several diameters, weights, and notes:—

	Diameter.	Weight.	Note.
1st Bell	3 ft. 9 in.	21 cwt.	G sharp.
2nd Bell	4 ft.	26 cwt	F sharp.
3rd Bell	4 ft. 6 in.	35 cwt. 1 qr. 6 lb.	E.
4th Bell	6 ft.	3 tons 17 cwt. 3 qrs. 24 lb.	B.

It may be well to mention that the notes of these four bells are at the same proportional intervals—reckoning downwards—as those of the 1st, 2nd, 3rd, and 6th of a peal of ten.

The great hour-bell, "Big Ben the Second," was cast under the direction of Mr. Denison, by Mr. George Mears, of Whitechapel, on the 10th of April, 1858. Here are the particulars:—Diameter (mouth), 9 ft.; height, 7 ft. 6 in.; thickness (sound bow), 8½ in.; weight, 13 tons 10 cwt. 3 qrs. 15 lb.; Note E, an octave below the E of the third chime-bell.

The great clock was made in 1854 by the late Mr. Frederick Dent, from the design of Mr. Denison, and fixed in the tower in 1859. "It reports its own rate electrically," says the latter, "to Greenwich twice a day, and the curator of it receives Greenwich time at the tower to enable him as well as the Astronomer Royal to see how it is going. . . . . It has seldom varied more than a second in a week or ten days. . . . . It contains a special contrivance for making the first blow of the hour strike exactly at the right time."

This clock chimes the quarters on the four bells above described (à la Great St. Mary's, Cambridge), thus:—

First Quarter	1, 2, 3, 4.
Second Quarter	3, 1, 2, 4; 3, 2, 1, 3.
Third Quarter	1, 3, 2, 4; 4, 2, 1, 3; 1, 2, 3, 4.
Fourth Quarter	3, 1, 2, 4; 3, 2, 1, 3; 1, 3, 2, 4; 4, 2, 1, 3.

The hour is, of course, struck on the great bell.

In conclusion, it remains to observe that on or about October 1, 1859, certain cracks were discovered on the surface of the present great bell, and consequently it was not allowed to proclaim the hours again for a considerable time. As to the cause of the cracks, the author of this article publicly expressed his opinion in 1865. I may, however, say here that the principal crack in the bell was found to be diametrically opposite to the hammer. In order, then, that the metal might be partially relieved from the strain at the places intersected by the cracks, the bell was turned about 3 ft. "with the sun," and a new clock-hammer not exceeding 4 cwt. was substituted for the old one of about 8 cwt. The result is, "Big Ben the Second" certainly speaks out in a more agreeable tone than he ever did when struck by the old monster hammer. Nevertheless, his voice is still imperfect. His fundamental note proper is never distinctly heard as it ought to be. The upper tones being chiefly inharmonic, a discordant and somewhat gong-like sound first strikes the ear. Then the octave of the fundamental note predominates in a more agreeable tone, and, being remarkably prolonged, is heard at a greater distance.

THOMAS WALESBY.

THE SEWAGE QUESTION.

Cheltenham.—The Cheltenham Commissioners having recently completed work, and purchased a farm for the disposal of the town sewage, by irrigation, the first yearly letting of the irrigation land has just been effected by auction. The land is all ordinary grass land, to which, as yet, the sewage is but imperfectly applied, and comprises 110 acres. It was divided into six lots, which let at prices, varying from 5*l*. 18*s*. to 8*l*. 13*s*. per acre, and realising a total of nearly 900*l*. The yearly cost to the town for interest and repayment of loan in thirty years, is 1,100*l*.; so that, if the rent of land should remain stationary, the town would only be put to a cost of 200*l*. a year, and own the farm free, at the end of thirty years, as against an expense of nearly 1,000*l*. a year, before incurred, with very unsatisfactory results, for deodorising. But, in addition to the rent of the land, the Commissioners apply the sewage to adjacent farms, at a certain charge per acre, and have reserved for experiment several acres of their own land which have been broken up for rye grass, and are expected to realise a profit of at least 20*l*. an acre; so that the farm will probably be conducted without loss even during the first year.

Crewe.—At a meeting of the Local Board, the deputation appointed to visit Warwick, Rugby, and Banbury, reported the result of their observations of the sewage farms in those towns. Rugby, it was stated, has fifty-three acres under cultivation, irrigated by sewage amounting to 250,000 gallons per day, which is run over the land four times during the summer. Various vegetables and Italian rye grass are the crops produced. The farmer stated that he and his family, though living in the centre of the farm, enjoyed good health and experience no nuisance from the sewage. After visiting Leamington, where the A B C process is in operation, the deputation expressed an opinion that after the sewage had passed through the process, the effluent water is not pure enough to satisfy the complainants respecting Crewe. It was stated

that the Leamington authorities are about to abandon the A B C process in favour of irrigation. At Warwick, a farm of 108 acres of stiff soil was found under cultivation with rye grass, mangolds, potatoes, and other vegetables. When the farm was laid the land was drained, but as the drains proved injurious to the system they have been destroyed. The effluent water was found to be beautifully clear, and, in the opinion of the deputation, it was devoid of all chemical impurities. Here again, the farmer reports that he and his family enjoy good health. At Banbury, 136 acres of stiff soil are under cultivation. The cost of plant was about 5,000*l.*, and the crops of the present year realised 1,400*l.*, after five horses had been kept out of the produce. Although the land was drained, it was the opinion of the town officials that the drains were of no use. The report concluded by stating that the result of the visits was a confirmation of the report of the Royal Commission appointed to inquire into the subject, and the visitors expressed their opinion that irrigation is the only safe and permanently satisfactory method of dealing with town sewage.

Doncaster.—Mr. Rawlinson, C.E., who has been called in by the corporation of Doncaster, to consult with Mr. B. S. Brundell, C.E., of that town, as to the best means of applying the public sewage to purposes of irrigation, has visited Doncaster, and with the members of the estate committee, made an inspection of the several sites proposed. There were three in number, all within two or three miles of Doncaster, and all on estates the property of the corporation. Mr. Rawlinson, who was required to consider a report made by Mr. Brundell, as to the means of pumping and conveying the sewage, approved of that report in every respect save as to the lands to be irrigated. Mr. Brundell recommended a site on low ground at Sandall as involving the least cost. Mr. Rawlinson, however, expressed a strong preference for a site of about 100 acres, at Wheatley Hills, which he regarded as one of the most suitable he had ever seen. He will, however, make an official report. The scheme will involve a cost of nearly 20,000*l.*, but the corporation appear fully reconciled to the outlay; indeed, it was Mr. Rawlinson's opinion that they would, in comparatively few years, reap a full return for their money. The work must necessarily be commenced almost at once.

Ashford.—A long report on the drainage of the town from Mr. Baldwin Latham has been read at a special meeting of the local Board. The existing sewerage was unhesitatingly condemned by Mr. Latham, and a new system recommended that would cost 10,500*l.*, which, spread over thirty years, would involve an annual outlay of 640*l.*, besides 250*l.* a year for pumping. About 400*l.* would be received for the sewage matter, which would leave 500*l.* to be made good. On the present rateable value of the property in the town this would be covered by a rate of 4*d.* in the pound. It was resolved to adjourn the consideration of the subject, and in the meantime the report of Mr. Latham is to be laid before the ratepayers, and a public meeting called to take the opinion of the town thereon.

Macclesfield.—In reference to certain remarks complimentary to the sanitary state of this town, delivered by local gentlemen at a lecture there, by Dr. Lankester, on the laws of health, the *Macclesfield Courier* tells his townspeople some wholesome truths on the subject. The *Courier* says:—

"It is a very cruel awakening from such a dream of sanitary perfection to wake up and find such facts as the following staring them in the face:—

'Among the towns of *highest mortality* are Maidstone, Reading, Oxford, Cambridge, Exeter, Stoke-upon-Trent, *Macclesfield*, Wigan, Bolton, Huddersfield, Halifax, Swansea, where the mortality ranged from 23·5 in Reading to 27·0 in Exeter, and 31·6 in Halifax. These high rates of mortality should be inquired into by the local authorities.'—*Registrar General's Report for quarter ending June*, 1870.

The *Times* has an article on the subject of the public health, based on these returns, and Macclesfield is again mentioned amongst the towns that have an unenviable notoriety for showing a high average death-rate. These remarks are a severe, but we hope a too severe, comment on the congratulations of our local orators. It is pleasant to robe our town in a mantle of perfection, but justice demands that on so vitally important a question as the public health the truth should be known. . . . . There are three streets all thickly inhabited, and in the very centre of the town, where the drainage is so defective that the ground upon which the houses are built is alleged to be literally saturated with the sewage. If this is the case, and if the germ theory of disease to which our attention has recently been directed by Dr. Lankester, is correct, the consequences to be apprehended from such a state of things is sufficiently serious. It is assuring to know, however, that the streets to which we have referred are the exception to the general system of drainage of the town, which years ago was greatly improved, and placed upon what was then considered to be a satisfactory footing. The greater reason, therefore, that immediate attention should be given to the streets in question, so that the fair fame of the town shall not suffer from such exceptional blots upon it."

Ealing.—During the past twelve months a series of experiments has been carried on at the Ealing Sewage Works, to test the system there adopted for the purification of the sewage of Ealing. These experiments have been carried out by Mr. Jones, the local surveyor, under the superintendence of Professor Way, who, after paying more than thirty visits, has drawn up a most favourable report, which has been published by the Local Board authorities. The sewage of Ealing is dealt with by means of filter-beds. The precipitants employed are lime and a cheap salt of iron, the latter made on the premises by a process suggested by himself. With the lime is used a preparation of tar, but the chief effect in the clarification of the sewage is due to the lime and the iron salt. The water passes by upward filtration through two filter beds. It is not for a moment asserted that the effluent water at the Ealing works is pure, and the only question is whether it is rendered so far free from offensive matter as to allow of its discharge into the Thames. Since the system has been in good working order he has considered the result to be very satisfactory.

Maidstone.—A lecture on "Sewage Irrigation" has been delivered before the Maidstone Farmers' Club, by Mr. Bailey Denton, C.E. With the exception of villages, public institutions, and isolated dwellings, where the dry-earth system may be adopted with advantage, Mr. Denton considers that there is no other treatment open to adoption than irrigation, if we are to do as the Legislature will shortly compel us to do. We give a separate abtract, however, of Mr. Denton's paper on another page.

COLESHILL BUILDINGS, PIMLICO.

SIR,—I do at least expect fair play from the editor of the *Builder*. And I respectfully submit to your sense of justice that I have not had fair play rendered me by your report of the Coleshill Buildings, Pimlico; for in the first place you state that my patent stone, which was used for chimney-pieces in the first built houses I erected for the company has been discontinued,* and in the next place that the stairs at Palmerston Buildings, four or five years old, appear much worn; statements evidently leading the public to believe that the company had been induced to abandon the use of the material as mantelpieces, and that the use of it as steps had proved a failure. In the first place, I may state that, so far from discontinuing it, I am still using my patent stone for chimneypieces in the buildings for the company I am now constructing at Bethnal-green, and the opinion of the company respecting my material is thus expressed in the report that was distributed at the opening of the Coleshill and Ebury Buildings. "One of the chief features in the construction of the Buildings, is the use of the patent stone manufactured by Messrs. Allen & Son, of Tabernacle-walk, Finsbury. This material, which answers its purpose admirably, is used as lintels, arches, chimney-pieces, stairs, window dressings, and cills, slabs, &c." Regarding the wearing away of the steps in Palmerston Buildings, I must tell you that it is not my patent stone that has worn away, but the stone nosings of York and Portland which I was requested to put in all the first buildings I erected for the company that have worn away, while my own material is as little worn as when it was first placed there. That this is a fact you can satisfy yourself by inspecting the first eight steps of the first block of the buildings in question, for they happen to be altogether composed of my patent material, and have the words "*Allen's Patent*" impressed thereon, and these very steps were used in the approach to the cottages at the late Exhibition, which were erected by the Central Cottage Improvement Company, and they are not the least worn, though, from being the lower steps leading from the street, they must necessarily have had the most traffic on them. I must also inform you that the company now have their steps altogether composed of my material, instead of being nosed with stone.

And now, passing from the stone material to the construction of the buildings, I beg to inform you that I am not disposed to relinquish my claim to the merit, or demerit, of being the originator of the general plan and arrangements of all the buildings hitherto constructed for the Company, whatever names may be set forward as the architects of them. If the design, plan, and construction of a building give any one the right of calling himself its architect, I respectfully submit that I am that one, with regard to these buildings; and that my assertion is a true one, I beg to quote a passage from a speech made by Sir Sydney Waterlow, last year, at the Mansion House:—

"It was right he should explain that all the buildings hitherto erected had been constructed by Mr. Matthew Allen, the designer and builder of the first block of Langbourn's Buildings in 1863, the model upon which all the subsequent buildings had, with minor variations, been constructed. He was glad to be able to acknowledge publicly the obligations he was under to Mr. Allen for the unremitting attention he had given to the work of the Company since its formation, and for the great talent which he had constantly displayed in arranging the details of the buildings, prompted at all times solely by a desire to promote the interests of the Company, by increasing the comforts and convenience of the tenants, frequently at increased cost to himself."

The buildings in Coleshill-street are upon the same general plan Sir Sydney referred to, and which may be proved by examining the buildings I have built for the company from the first to the last, with the exception of a few minor details that Messrs. Beck & Lee have thought fit to add, such as the towers on the roof and their plan of ventilation.

I hope you will do me the justice of inserting this letter.

MATTHEW ALLEN.

* This is certainly the case in Coleshill Buildings.

ARCHITECTS CHARGES AND TERMS.

SIR,—As a contribution to the discussion respecting the property in architects' drawings, I send you a copy of the printed form of account I have used since the controversy commenced, and have added words in manuscript, which, in consequence of the decision in Ebdy *v.* M'Gowan, I shall insert in future accounts.

F. R. I. B. A.

N.B. The following charges are on the supposition that, according to the usual custom, all drawings and specifications (except those specially charged for to deposit), and the copyright thereof, remain the property of the architect. Or if you prefer it, they will be given up to you on payment of an additional 1 per cent. commission:—

	£	s.	d.
Preparing designs, contract and working drawings, and specifications, for the above undertaking; superintending the works, and adjusting the accounts, 5 per cent. commission on the total outlay, including the value of any old material reused, and of any material, labour, or goods supplied, which do not appear in the accounts			
Negotiating and ordering painted glass not designed by me, 2½ per cent. on cost			
Preparing designs, contract drawings, and specifications, and obtaining tenders for works not carried out, 3 per cent. on the amount of lowest tender			
Preparing designs, contract drawings, and specifications for works not tendered for, 2½ per cent. on the amount of estimate			
(N.B.—If employed to carry out the works mentioned in either of the last two clauses, the drawings will be at your disposal for the use of the builders, and the above charges relating thereto will be credited you as part of the full commission; or, if you prefer it, the drawings, &c., will be given up to you on payment of an additional 1 per cent. commission.)			
Preparing bills of quantities for works not carried out which would have been paid for by the builder if carried out, 2 per cent. on the outlay, and cost of printing			
Preparing drawings and notice to deposit with Boards of Health			
Preparing ditto to deposit with Society			
Making alterations in drawings, &c., after being approved			
Paid travelling expenses of journeys			
Paid postages, parcels, telegrams, agreement, stamps, &c.			
Payments on account of the work, as per vouchers			
	£		
By cash received			
Balance due			

THE QUESTION OF QUANTITIES.

SIR,—In 1868 I sold ground for a public building, and tendered for the erection of the building on the same, under a City architect, Mr. E., who appointed a quantity clerk to take out the quantities in his office. The amount being more than the architect's estimate to the committee, omissions to the amount of 650*l.* were had recourse to. The work was proceeded with under the contract, and schedule list for the additions and omissions, with an understanding that, on the completion of the job, the quantity clerk would measure up the work, and add or deduct as the case might be. On my applying to him, to know when he could come to measure up the work, I was told he could not until ordered to do so. I then, for the first time, asked him for the dimensions of the quantities, when he told me they were at the architect's office, where they were taken out with the assistance of the architect's head clerk. I have made several applications, and my solicitors have written several times for these dimensions without any effect, and the only alternative I have is to sue the quantity clerk for the deficient amount. This is the first time I ever was refused the dimensions or key to quantities. Such refusal cannot surely be defended.

W. H. W.

METROPOLITAN RAILWAY SITES COMPETITION.

SIR,—Your correspondent "J. D. M.," in your last week's issue, justly points out the waste of labour on the part of several of the competitors in sending detail plans and elevations which even they themselves cannot expect to be carried out, even should their general plans be adopted.

There is another fact, however, of much greater importance, to which the attention of whoever makes the award should be directed, namely, that some of the competitors have included in their plans adjoining properties which do not belong to the company.

In preparing plans for laying out estates like these, it is very convenient and easy *on paper* to shift a boundary a few feet more or less here and there, where necessary to obtain a good approach, or get over an inconvenient right of light or other difficulty; but it is needless to point out that such plans are utterly useless for practical purposes, though acting greatly to the disadvantage of plans in which the proper boundaries, with all their attendant inconveniences, are honestly adhered to.

It may be pleaded in excuse that "it is proposed that the additional property should be purchased;" but even should the company have the *will* (which at present I

should think very unlikely) and the powers to do so, I maintain that this is beside the question, the object being to obtain plans for laying out and utilising the surplus lands as they exist, or, in other words, to make the most of what the company have now got, and not go in for more extended land speculations, the success of which can easily be judged when the land has to be bought under compulsory powers, as would be necessary in this case.

L. N. G. A.

HALIFAX BUILDING SOCIETY'S OFFICES COMPETITION.

Sir,—I have refrained from writing concerning this matter, waiting to see what the directors' explanation of their conduct to me could be; and now I see what excuse they intend making for not only breaking faith with me after instructing me to prepare the drawings and specifications, but resolving to set my plans aside, without allowing me the opportunity, *or even the drawings*, to obtain tenders. I have received no remuneration, nor have I been satisfied in any way whatever; but have placed the matter in the hands of my solicitor.

F. W. Hagen.

MEMBERS OF THE INSTITUTE AND THE PROFESSION.

Sir,—Will your esteemed correspondent oblige me by stating, in your next issue, whether he considers that "taking payment from builders for quantities" is an infringement of the rules of the Institute, which he is prepared to bring before the Council, on production of proof?

This would be no difficult matter; but to obtain *positive evidence* of taking commissions is much more so, as it is almost always done "under the rose," though, I have reason to think, it is more common than Mr. Donaldson appears to believe.

E.

RAILWAY COMPENSATIONS.

TODD V. THE METROPOLITAN DISTRICT RAILWAY COMPANY.

The plaintiff in this case (Court of Common Pleas) was a builder, and he sold to the defendants fifteen houses in Eccleston-place, Pimlico, and also Stanley House, Milner-street, and the line was carried through this property in a cutting. The purchase-money was paid, but the plaintiff afterwards claimed further compensation upon the ground that his adjoining property had been "injuriously affected," and the compensation jury awarded him 200*l*. The present action was to enforce this finding.

Mr. Francis appeared for the plaintiff, and Mr. H. Lloyd, Q.C., and Mr. Harrison for the defendants.

It was stated that in making the railway pumping-engines were set up, and a large quantity of water was drawn off, and the consequence was that a settlement took place in the adjoining houses. The question was whether the plaintiff could legally claim compensation in respect of this settlement. One of the agreements stated that the sum originally paid was to be in full compensation for damage by severance and injury to adjoining land of the vendor, and "for otherwise injuriously affecting such adjoining land;" and the other contained similar words.

After some discussion, it was agreed that the question was one of law, and it was arranged that a verdict should be entered for the plaintiff for 357*l*. 5*s*. 2*d*., subject to the opinion of the full court.

Mr. Francis hoped that as this claim was a small one the case would not be allowed to be carried beyond the Court of Common Pleas, for otherwise the plaintiff might be put to enormous expense.

Mr. Lloyd said that he could not consent to this course, because the question was a most important one, and the decision would affect many other claims.

His Lordship (Mr. Justice Smith) said that he could place no restriction upon the defendants.

TO REMOVE PAINT FROM STONE.

Sir,—I see in your last issue a question as to removing paint from stonework. During the past summer, in restoring a church, under Mr. Norton, I had to clean a pulpit and sedilia in which the carving and tracery were almost filled up with successive coats of paint. I was informed that common washing soda, dissolved in boiling water, and applied hot, would remove it. I found that 3lb. of soda (cost 2½d.) to a gallon of water, laid on with a common paint-brush, answered the purpose admirably, softening the paint in a short time, so that it was easily removed with a stiff scrubbing-brush; afterwards, on adding a few ounces of potash to the solution, it softened more readily than with soda only. The stone in both cases was a fine freestone, not unlike Caen. If your correspondent will give this a trial, he cannot fail to be satisfied with the result.

S. B. Burton.

Sir,—If your correspondent, "N.," can place the font, &c., in a solution of pearlash, or common potash, he will find the paint softened in a few hours, which must be carefully cleaned off, and the font placed in the solution again if necessary. The time and expense depend on the number of coats of paint to take off; if the solution be applied hot so much the better. I have had it used to clean paint off fonts and other stonework, several times effectually.

J. R.

TOUTING.

Sir,—A letter received by a client, which I inclose, has led me to consider whether the "trade" of an architect is not capable of still further development than the writer seems to imagine.

The announcement of periodical visits, with "plans of all kinds ready prepared," might be improved by having, as is the custom with many travelling *artistes* in the circus and show line, an agent in advance, who might have some striking illustrations (not to say placards), to prepare the public mind for the arrival of the great principal, with his sample-sheet of plans.

An Architect.

Sir,—Having occasion to travel by the Railway every fortnight into Pembrokeshire, I am in a position to undertake professional work in your district, and properly superintend it, and so save my clients running up the always unwelcome and sometimes heavy extra account for "travelling expenses."

An experience of some fifteen years in restoring churches, and erecting houses and schools in various parts of England and Wales, will enable me to furnish (if desired) plenty of references. Any information, too, respecting the dates of my journeys I shall be happy to furnish on application.

As I cannot write many of these letters, perhaps you will kindly acquaint your neighbours with the chance afforded them now, I suspect, for the first time, of securing cheaply all the advantages commonly resulting from the employment of a "resident architect."

As to schools,—

"I have plans of all kinds ready prepared."

*** We have received a copy of this letter from four correspondents.

THE BINGLEY SEWERAGE SCHEME.

A Bradford local journal thus writes of what it terms "A Novel Sewerage Method":—

"The Bingley Local Board of Health have been placed in a peculiar position by the Home Office. The Board experienced some difficulty in providing for the drainage of the town, and brought their difficulties under the notice of the authorities in London. A memorial was prepared, and in it a suggestion was made that it was desirable to hold a local inquiry in order to reconcile certain differences of the parties interested. The Home Secretary sent down Mr. Robert Morgan in September last; and he has reported to Mr. Bruce that sewers should be constructed throughout a good part of the town at a sufficient depth to prevent all sewage matter from entering the streams or watercourses, such sewers to convey all sewage matter to land suitable for its utilisation by irrigation. The Bingley Local Board have decided to carry out the scheme."

We would remind our friends in Bingley and elsewhere that the above "novel method" is in no ways novel. We will repeat that, until all sewage matter is kept clear from dilution by the ordinary surface water and rain-pour of our towns and cities, the wild waste of valuable fertilising agents will go on unchecked, and sewage can never be properly or profitably utilised for irrigation purposes.

HOTELS.

There are two classes of hotels; the one class devoted to purposes of recreation, the other to those of business; the former situated more particularly at seaside or inland watering-places, the latter in towns. It is with the first of these two classes, in their arrangements and administration, that the following remarks propose to deal.

During the last few years large sums of money have been spent in the erection of hotels, the sites being chosen with the nicest discrimination, so that the natural beauties of the situations may be seen to their greatest advantage; and the utmost facilities have been offered by railways for getting to them. Internally all the modern appliances for ensuring comfort have been adopted, and Art has lent her aid to throw a charm over the whole, in order that the most fastidious taste should be gratified. Now, how is it that, possessing all these undoubted advantages, the shareholders in these concerns, in such a large proportion of instances, have such a meagre return for the money they have invested?

One fundamental error which runs through the whole is that of taking a wrong model for a basis on which to work out the design. This model is that of the club. A very short consideration shows that the two establishments, the club and the hotel, have in their purposes very diverse requirements. In the one case all the members are, or can be, known to one another. Not so in the other: a permanent as against a temporary interest. The same social status of the members in the one; not generally so in the other. Publicity in a club; privacy in a hotel, all the more urgent in this case, where females, either with their families or without them, may be inmates. In a club, too, a home for *one* large family, so to say, is the guiding principle; whereas, in a hotel, it is that of *distinct* homes for many families accidentally brought together. This distinction in principle gives an advantage to the treatment of a club façade in its simplicity and in the dignity it derives from its suite of state rooms, these qualities being entirely wanting in the hotel. Here we have a vast aggregation of small rooms, with small window openings, possessing neither dignity nor repose.

The windows look like pigeon-holes in contrast with the bulk of the façade, and looking more and more so as the size of the elevation is increased. This appears bad enough in towns, but in the country, among scenes of beauty, it is intensely discordant. And as there are so many shareholders in these concerns, it is sad to reflect that for so many a shadow must be cast over some of our fairest scenes, when perhaps in turning from the contemplation of some old ruin or glorious landscape, their eyes should alight on the gaunt mass of the "—— Hotel Company, Limited," their day-dreams vanish, and they are brought down to the sordid cares of life again in reflecting how, to raise this pile, so much money has gone from their pockets, which "place shall know it no more for ever."

Now this obtruding of itself so prominently, one might almost say vulgarly, in the landscape is a great eyesore, and ought to be remedied, and the direction the remedy ought to take should be towards the principles which prevail in the development of villages. These are never an eyesore, but lend a human interest to every scene. In fact, these institutions should be pleasure villages, not palaces. Upon this principle, too, we should avoid over-building, as unfortunately happens much too frequently at present, as if indeed numerous rooms could bring numerous customers. Like villages, they should grow as the requirements of visitors demanded. Of what earthly use is an empty hotel? Its internal arrangements are not such as to suit a private family, however large or important. We have one now in our recollection which was typical, being grand and nearly always empty, and those who have experienced it only know how dreadfully depressing these large hotels are when in this condition. One feels subdued and ready to apologise to the waiters for bringing them through such a long perspective of corridors to wait on our insignificant selves, and when the bill comes we hesitate to demur to a few pounds extra charge, from a feeling that we should be out of keeping with the surrounding magnificence. Well, this hotel's ultimate destiny was frequently canvassed, and being at a port, the only thing that looked at all feasible was to make it a granary.

How many of these evils would be avoided if in designing these establishments the palatial style were abandoned and a more rural one adopted? They should be built in independent sections, to form houses or suites of apartments, but all united with one central department. This department should contain the hotel coffee-rooms, reading and billiard rooms, smoking-room, baths, &c., and the enjoyment of these should be at the option of the tenants. Parties should be able to take apartments or houses, with service from the central department or of their own bringing, as they wished. It should be competent for them to buy all necessaries at the central department, instead of having to seek them at a distance, and have all cooking done at their own place or at head-quarters, as they should prefer. Many, too, resort to hotels to be restored to health, because there they find many conveniences which the ordinary frowsy lodging does not possess; but it would facilitate their recovery if they could enjoy these advantages without at the same time participating in the noise and bustle of the surroundings.

This mode of arrangement would likewise be of great advantage to those who like a "little place out of town," who, overworked in town, like to get away for a little quiet at odd moments and for short periods, but who find the cost and care of such a place, when temporarily unoccupied, a great bar to its enjoyment; it would enable them to take apartments or a house permanently, and to furnish it themselves; and when unoccupied, it might be left in charge of the central administration. No notice need be given of their intention to occupy their places,

as they would be always in a fit state, and, of course, meals, stores, &c., could be had on the spot. There is no doubt, too, that much is lost by the absence of that personal intercourse between customer and landlord which existed at the old inns. This intercourse might be revived by sub-letting the house to others who would take them as a matter of speculation, and who would naturally do their utmost to work up a connexion, and by personal exertion and courtesy induce their customers to repeat their visits. Above all, the surroundings should be more homely: people pay for recreation, not magnificence, when they take their holidays. But as it is at present, empty rooms, unused furniture, unemployed servants must be paid for somehow; and if the money is not got out of grumbling customers, it must be out of grumbling shareholders. The hotel system as at present developed is manifestly not suited to the English character, and it is with a view to suggesting a way by which these two might be brought into harmony that the above remarks have been written. I.

LETTERING ON STONE.

YOUR correspondent, "J. M.," if living in a large town, would probably do best to buy his black paint ready prepared for lettering, it being kept by many oil and colour men; and, as far as my experience goes, is the custom. To prevent the oil running into the stone, let him give the letters a coat of gold size before blacking them. If marble, isinglass should be used.

S. B. B.

THE "BUILDER" LIFEBOAT.

SIR,—I was pleased to see in your paper of last week, a letter from a correspondent, suggesting that a fund should be raised, amongst those connected with the building trade, for the purpose of purchasing a lifeboat, to be presented to the Royal National Lifeboat Institution. As he says,—Lifeboats have been presented to it by many leading professions and trades, and as the building trade is so largely represented, I sincerely hope that his project may be fulfilled. The cost of a lifeboat, boat-house, transporting carriage, and all appurtenances, is about 700*l*.

The present fleet of lifeboats now belonging to the Institution amounts in number to 223, and the expenses of keeping it up are of course considerable. N. W.

A BUILDER'S CHARGE FOR MAKING ESTIMATE.

THE case heard at the County Court, Lewes, —"*James Peerless* v. *Countess De Noailles*,— was a claim of 50*l*. on the part of Mr. James Peerless, builder and surveyor, of Eastbourne, against the defendant, occupying Holywell Lodge. Mr. Campion Coles was for the plaintiff, and Mr. Stiff for the defence. It appeared that last year the Countess was desirous of making some alterations to her house; and, in consequence, her architect, Mr. Rumble, waited upon the plaintiff with instructions for him to prepare a detailed estimate. He did so, but the work was not given to him; it was carried out by Mr. Hounsom. Consequently, plaintiff charged for his labour in preparing the estimate two per cent. on the proposed outlay, which, with some minor charges for other matters, amounted to 50*l*. Mr. Stiff said he could prove that the plaintiff sometimes prepared estimates, and made no charge, whether he got the work or not. The judge, Mr. Furner, said if plaintiff chose to do so that was entirely at his own option. He had, no doubt, a right to charge a fair sum for his labour. Mr. Rumble, Mr. Henry Card, County Surveyor for East Sussex, and Mr. Charles J. Berry, surveyor, of Lewes, were called, and proved that they had looked over the estimate, and considered 2 per cent. to be a fair and moderate charge. The Judge gave a verdict for plaintiff for the amount claimed, except 4*l*. paid into court.

THE LATE MR. DALE, ARCHITECT.

SIR,—As an old and constant subscriber to your valuable journal, and being to a certain extent connected with a subject which has latterly engrossed the attention of some of your correspondents, culminating last week in an editorial comment on Mr. Dale, the architect, of Storey's Gate, St. James's Park (as also connected therewith), I consider it my duty to apprise you that, to the great grief of his family and a large circle of friends, that gentleman, after a short, painful illness, departed this life at ten a.m. on Saturday, the 10th inst., at his house in Warwick-square, S.W. He was at business up to the middle of the week, although very unwell, when his medical advisers enjoined perfect rest, quiet, and freedom from any excitement; but it was in vain. To me, in a business view, it is a source of considerable trouble and anxiety, as he was most active, energetic, and attentive to the matters he had in hand in all their details.

I have, Sir, myself refrained hitherto from all participation in the recent correspondence on the so *justly called* "Erroneous Estimating," but hope to have your permission to join in it when the proper time arrives.

HENRY R. WAGNER.

17, *Palace-street, Buckingham Gate.*

LES DEUX CHEVAUX DE BRONZE.

AN OVERTURE.

THE humble petition of the two Horses appointed to bear the effigies of our beloved Queen and lamented Prince Consort respectively, of late established in front of the building known as St. George's Hall, in the borough of Liverpool, to the most respected the Editor of the *Builder*, showeth:—

That your petitioners understand that they are placed in their present position by the Town Council.

That they are unaware of the nature of a Town Council, but suppose it to be a contrivance for putting up statues; only in that case they wonder it has never been used for putting up any on the building behind them, which they hear say is wofully bare of such adornments.

That your petitioners, being loyal quadrupeds, will say nothing touching the aspect of the Royal images which they bear, opining, indeed, that there is very little to be said thereon; but that as regards themselves, being conscious that they are but shady-looking brutes, of unconscionable size and questionable anatomy, they feel acutely that they have been made unwilling agents in defacing the aspect and obscuring the view of the noble building against which they are backed.

That your petitioners are placed upon unsightly pedestals so high that any one coming near enough to examine the features of the Royal effigies can see nothing of your petitioners but the under part of the belly, &c., and that your petitioners have a decided objection to being studied from such a point of view.

That your petitioners' tails are switched out behind in an absurd and preposterous manner.

That your petitioners are on these grounds the subject of comment and ridicule on the part of all sensible people.

That your petitioners have heard of the lion lying down with the lamb, but respectfully submit that this is no precedent for two horses standing up with four lions, all of row.

That your petitioners are altogether in the wrong shop, and feel excessively foolish.

That in view of the foregoing facts, your petitioners humbly beg that you will graciously use your influence, which they understand is considerable in such matters, to the end that the aforesaid Town Council may be made use of in transporting them to some suitable situations, where they may appear as the principal objects of attraction, instead of being eclipsed by a great building behind them, and getting abused for spoiling its appearance; and that they may be placed upon fitting pedestals of a decorous height.

And your petitioners shall ever neigh, &c.

Given from the Menagerie, in front of St. George's Hall, in the borough of Liverpool.

THE ROYAL ACADEMY MEDALS.

ON Saturday evening, the 10th inst., Sir Francis Grant, as president, gave the medals to the successful students as follow:—Painting from the life, Mr. Frederick Cottman; drawing from the life, Mr. Douglas Miller; drawing from the antique, Mr. E. Hughes; best restoration from the antique, Mr. Abel Thorneycroft; best copy from a painting from an old master—Reynolds's Sir William Chambers—Mr. William Gair; architectural travelling studentship, Mr. Walter Lonsdale, for a design for a national mausoleum; best architectural drawing, Mr. Henry Hall; best model from the antique, Mr. Abel Thorneycroft; and the premium of 10*l*. for the best drawing from the life done at the Academy during the present year, Mr. F. Cottman.

In the course of his address, the president expressed regret that the year's work, in the opinion of the council, was not up to the mark; the contests for most of the prizes were disproportionate to the numerical strength of the schools of the Royal Academy. Still, several of the students' efforts were of a highly creditable description. It was lamentable that one of the architectural prizes should have failed to induce more than one student to compete. The president then adverted to the forthcoming exhibition of the works of the old masters as one to which the students ought to pay frequent visits. It would far surpass the previous exhibition, interesting and successful as that had proved. Her Majesty had graciously promised to contribute some of the choicest of the works contained in the Royal Galleries, and the exhibition would be further enriched by contributions from the Earl of Dudley, the Marquis of Westminster, and other gentlemen. The exhibition would also contain a number of noble works by deceased members of the Royal Academy.

SCHOOLS OF ART AND OF SCIENCE.

The Leeds Schools of Art and Science.—The proceedings in connexion with the annual distribution of prizes and certificates gained by the students took this year the form of a *conversazione* and public meeting in the Mechanics' Institute, Cookridge-street. In carrying out the former the picture-gallery and the whole of the spacious class-rooms were called into requisition for the exhibition of works of art and antiquities. The attendance of the students and their friends, and of the general public, was exceedingly large, the greatest possible interest being manifested in the exhibition. The public meeting for the distribution of prizes was held in the hall of the Institute. Amongst those present on the platform were Lord Houghton, Mr. J. D. Luccock (president of the institution), Sir Andrew Fairbairn, Mr. E. Baines, M.P., and others. Lord Houghton took the chair. The report said:—

"The committee have pleasure in presenting the following particulars of the art and science classes during the past year:—

The art classes have made great progress under Dr. Puckett, and the number of pupils has considerably increased.

	1869.	1870.
Number of pupils who have attended during the year	255	326

showing an increase of 71 pupils. These numbers are exclusive of those pupils taught in the day schools. The number of pupils at present under instruction in art in the boys' school, 80; girls' school, 146—total, 226: thus making a total of 552 pupils under instruction of the art masters in this institution. The average attendance in the School of Art during the past quarter has been 120. The number of students who have entered for the present quarter being 210, against 165 in the same quarter of 1869—an increase of 45 pupils.

The science classes have been held in inorganic chemistry, organic chemistry, metallurgy, mathematics, and theoretical mechanics, in addition to the subjects taught in the School of Art, practical, plane, and solid geometry, machine construction and drawing, and building construction.

SCIENCE EXAMINATIONS.

	1869.	1870.
No. of students obtaining certificates	36	41
No. of Queen's Prizes	8	15
No. of Certificates	75	97
No. of Medals	silver 2, bronze 1	silver 1, bronze 1

Lord Houghton said:—In the prizes which I have to distribute this evening, I would lay especial stress upon those which have regard to the study of science, because what we call science is, in fact, knowledge. The words are really the same. The entire difference between a boy who presents himself at any one of your great manufactories and asks for employment, and who has had, say, a scientific education, and one who has not, is, that the one who has had a scientific education even of the most elementary character *knows* where to put his hand; he knows the relation—at least, if he does not know all the circumstances connected with the machine that he sees before him, he has got elements from which practice will make him learn, and he has the foundation of thought, and the habit of connecting one fact with another. I have also to distribute prizes connected with art; and here you get into a totally different order of thought, and a totally different series of objects and of purposes. You see a picture or a drawing before you, and you ask, "What is the use of it?" The only way to show the use of it is to suppose there is something in the human mind, some interest which is natural to mankind, which makes this thing matter of use. I have no doubt to an Ashantee savage there would be no use whatever in a picture except the peculi-

arity of bright colour which might please his eye; and therefore a picture in which there was nothing but bright reds and yellows would be the thing he would like the best. But art grows up in the human mind with civilisation. It grows up very unequally. Some nations develop it very early, and develop it in the most extraordinary manner, as the old Greeks did—a little people—the whole population not much larger than that of the town of Leeds, and yet who developed in a couple of hundred years or less more art than has been developed in the whole world perhaps before or since, and has left models which you have got in your room there, and which you look upon every day with pleasure. But this sentiment of art remains perpetual in the human breast. The young poet, Keats, who you know was a chemist's apprentice, a man of no particular culture or education, except what his own wonderful development gave him, began his greatest poem with this line, "A thing of beauty is a joy for ever." The line was laughed at very much at the time. All the fine critics said it was a ridiculous thing. The poor boy was hunted down. He had a bad constitution, and he died young, and was said to be "done to death" by the critics. Not that I believe that, for he was rather a brave fellow than not. But one day when I was at the Manchester Exhibition, where were collected together all the most wonderful works of art that England could produce, it struck me as very interesting that the gentlemen who collected together that great exhibition could find no better sentence to put over the great gateway of it than the first line of the poor young chemist boy's poem,—

"A thing of beauty is a joy for ever."

And the reason why that line will live as long as the English language lasts is that it is thoroughly and simply true.

The Penzance School of Science and Art.—The numerous friends and patrons of this school, with relatives and well-wishers of the students, assembled in the studio at Regent House, to witness the ceremony of giving prizes to the pupils for the past year. The mayor presided. The report said:—

"Your committee have pleasure in stating that, after having paid off the contract for enlarging the school accommodations, they find the school-fund is but 5*l.* 2*s.* 9*d.* in debt to the treasurer — a debt which it is trusted will soon be discharged.

The number of students slightly decreases from the reporting of last year, but the same ought perhaps to be accounted for by a remembrance of the remarkably fine season through which we have lately passed; the influence of which certainly did not tend to compact school-classes. At present, the head master states that the classes are filling up exceedingly well.

In art, the number of prizes is the same as that of last year, but in science, though we have to report only one prize taken, yet, on the whole, the result is satisfactory."

The Bristol School of Art.—The prizes and certificates awarded by the Science and Art Department at the last examination of this school were publicly distributed at the Fine Arts Academy by Mr. Gambier Parry, of Highmore-court, near Gloucester. Mr. P. W. S. Miles presided, and there was a very large attendance. The president remarked that the school had done exceedingly well during the past year, two Queen's and many other good prizes having been gained by the pupils, whilst the works of twenty pupils had been retained at Kensington to be put in competition for the gold medal. He said the institution was hampered with a debt of 650*l.*, and that whilst schools of art were assisted in other towns by the municipal authorities, nothing was done for that school by the corporation. Mr. Parry then delivered a very able address upon the advantages of art study. He spoke strongly of the necessity of studying art thoroughly, as calculated to benefit England morally and pecuniarily; and, in reference to our schools of art, said the system that had been adopted was very good up to a certain point: the elementary teaching was very good, but the advanced teaching was very inferior, and the highly advanced almost non-existent. France and Germany had entirely beaten us in the matter of art, because they had gone more pertinaciously on to a thoroughly complete course. They had laid great stress on the technical elementary beginning of art, and had gone at once into the higher branches. It was to this, if the English as a nation would excel, that they must pay attention. After the distribution of the prizes, thanks were voted to the president, to Mr. Parry, and to the head-master of the school, Mr. Smith.

Newcastle-under-Lyne School of Art.—The annual meeting of this institution was held in the Guildhall, the Rev. L. T. Stamer, bart., presiding. The seventeenth annual report of the school was read by Mr. Earl, the secretary. It spoke satisfactorily of the advance of the school, an increase both in attendance and results being recorded. The pecuniary support given was, however, so small as to greatly cripple its efforts, and diminish its usefulness; and so long as the income barely met the expenses the committee would be unable to offer local prizes, and would have to depend entirely upon the Science and Art Department. The financial statement showed a small balance in the treasurer's hand. The report of the master stated that the school continued to progress, and that at the annual examination in March last, 22 students were examined, of whom 11 passed, and three won prizes. The drawings of 39 students were forwarded in April, in national competition, of which those of 37 were satisfactory, and 4 prizes were awarded. In addition, H. Baggaley obtained a free studentship, and W. P. Rhodes a national scholarship. This school competed for the bonuses offered by the Department to the schools which had made the greatest progress, 100 schools competing, and Mr. Bacon, the master, received an award of 10*l.*

CHURCH-BUILDING NEWS.

Chaldon.—The ancient parish church of Chaldon, after undergoing a restoration, has been reopened by the Bishop of Winchester. As was announced some time ago, when the work was commenced, some wall paintings were discovered in the west end of the chancel, representing the future world. They are supposed to be some of the finest in England, and, under the care of the Surrey Archæological Society, have been carefully preserved.

Tunbridge Wells.—The new church of St. Stephen has been opened, by special license from the Archbishop of Canterbury. The building has been erected by the Rev. H. W. Hitchcock, as a mission church, in which the founder himself will minister. The architecture is what may be termed Domestic Gothic, and the edifice contains about 200 sittings, the contract price being 670*l.*, but this does not of course represent the whole cost, inasmuch as there are the fittings, the organ, and other addenda. The church is composed of red brick with tile facings; it has an arch-timbered roof, and it is lighted with dormer windows at the sides, and two large ones at both ends, consisting of cathedral glass,—rough British plate. The east window is of stained glass, by Messrs. Heaton, Butler, & Bayne, and is of an ornamental character, in which the central figure is the Redeemer, portrayed as the Good Shepherd. All the seats, which are of stained deal, are free. The building is heated by means of a stove (by Parrett), which is placed underneath the centre aisle. The nave is 44 ft. long and 24 ft. wide. There is a chancel, the roof being painted with an occasional text of Scripture introduced. The pavement is of Maw's tesselated tiles. The gas-fittings were supplied by Messrs. Hart & Co., of London. The church, which is in the form of a cross, was built by Messrs. Edward Wheatley & Sons, of Tunbridge, from the designs of Mr. A. C. Blomfield, of London; Mr. Wright being the resident architect.

Highclere.—As we announced some weeks ago, the new parish church at Highclere was consecrated and opened at the end of last month.

Bristol.—The corner stone of the new church of St. Mary, Tyndall's Park, has been laid. When erected, it will take the place of the iron structure in which the Rev. W. F. Bryant has ministered during the last few years. Under the present contract only a portion of the work will be proceeded with. The contract price for this section of the building, which is to be erected by Mr. J. Diment, is 980*l.*, and it includes the chancel, the transept, and two bays of the nave, besides a vestry-room for the clergy, and a vestry for the choir. The church will be built in the Decorated style of the middle of the fourteenth century. It will accommodate 720 persons comfortably, which may be increased to 750 by the introduction of chairs when extra accommodation may be required. The whole of the sittings will be free. The edifice will consist of a chancel, 40 ft. in length, a transept on each side of the chancel, and a nave, which will have two aisle. The nave will be 84 ft. 6 in. long, and 26 ft. wide. The aisles will be 12 ft. wide. The great inequality of the ground towards the south affords means for introducing a couple of vestries, a priests' vestry, and a choir vestry, underneath; and a wide staircase will be provided at the east end of the church, which will bring the clergy and choir up to the south transept, from which they will pass into the chancel. The transepts will be at right angels with the choir, and there will be a considrable clearstory and a steeple at the west end of the north aisle. It is hoped that funds will be forthcoming to commence the second part of the building immediately after the completion of the first; but as the total cost of the church will be between 8,000*l.* and 9,000*l.*, the period of the completion of the edifice is problematical.

Great Burstead, Billericay.—An improvement has been effected in the interior of the parish church. The long-condemned gallery, in which the organ was placed, has, with the pews underneath it, been removed, and the organ has been renovated and re-erected beneath in an organ-chamber, elevated about two feet from the ground, and a little in advance of the western arch, by Messrs. Bryceson & Co., of London. It is hoped that this first step in the right direction will be followed, if not by the repewing of the church, at any rate by the cutting down of the present high pews, and the placing of the pulpit and desk in a more eligible position.

Armley Hall.—The foundation-stone of a new church at Armley Hall has been laid by the Bishop of Ripon. The building is to replace a temporary one erected under the auspices of the Leeds Church Extension Society, and will cost between 3,000*l.* and 4,000*l.*

Dyffryn, near Neath.—The foundation-stone of the new church of St. Matthew, for the benefit of the outlying parts of the parishes of Cadoxton and Skewen has been laid.

Radcliffe.—The parish church has been reopened for Divine service. In the spring of this year the roof (an open-timbered one), had given unmistakable signs of being in a dangerous state, and the churchwardens determined upon its restoration. The clearstory walls were also in a dilapidated condition, and it was found necessary to rebuild them. The dilapidated condition of the clearstory was in great part due to the interments which (most of them long ago) had taken place around the nave pillars, by the graves being actually below their foundations. Care has been taken to preserve, where practicable, the ancient features of the roof. It consists of four "principal beams," panelled and moulded, having in the centre angels with outspread wings, and holding the emblems of Faith, Hope, Charity, &c. The plumber's work has been executed by Mrs. Colley, of Radcliffe Bridge, and the masonry by Messrs. Hall & Ogden, of Bury. The work has been carried out under the superintendence of the architects, Messrs. Medland & Henry Taylor, of Manchester.

Woodlesford.—At Woodlesford, near Leeds, a new church, dedicated to All Saints, has been consecrated by the Bishop of Ripon. The church is in the fourteenth-century period of Gothic, and from the hill on the south and east is a very conspicuous object. The tower is on the south side, adjoining the transept, with stone staircase to bell-chamber, containing peal of six bells by Messrs. Mears & Stainbank, of London. The spire rises to 140 ft., including iron vane. The material used is Oulton stone. The interior is divided into nave, chancel, north and south transept, vestry on the north side, adjoining the north transept, organ-chapel under the tower, and south porch. The east window is a four-light, the head being in three quatrefoil openings, and is filled with stained glass by Ward & Hughes, of London. The north and south chancel windows are each two-light with trefoil heads, and are filled with stained glass by Lavers, Barraud, & Westlake, of London. The transept windows are three-light, with rose windows over. The windows to nave are two-light, with traceried heads, &c. The west windows are three single lights, with trefoil heads, and rose windows over, and are filled with stained glass. The entrance is through the south porch. Massive arches, supported on Caen stone caps and corbels, and red Devonshire marble shafts, separate the chancel and nave, and nave from transepts, organ chapel, and vestry. The nave roof is open-timbered, boarded, stained and varnished, and the curved principals are supported on Caen stone caps, red stone octagonal shafts, and carved Caen stone corbels, with figures of the prophets, &c. The chancel roof is similar to the nave, and the principals are supported on Caen stone caps, red marble shafts,

and Caen stone corbels of the evangelists, &c. The chancel and sacrarium are laid with encaustic tiles by Minton, Hollins, & Co. The seats to nave and transepts are of deal, stained and varnished. The choir seats and priests' stalls are of oak. The chancel is faced with cleansed stone inside, and the nave and transept walls are plastered and colour washed. A Caen stone low wall, pierced with quatrefoils, divides the nave from the chancel. The screens to the vestry and organ are of pitch pine, varnished. The pulpit is of Caen stone, with carved caps, red and green shafts of Irish marble, bases, moulded and carved cornice. There are five panels, three of which are sculptured, representing the Transfiguration, Christ's Charge to St. Peter, and the Pelican and Young. The font is circular, of Caen stone, with moulded caps and bases, and red and green marble shafts, and has four circular carved panels, the chief one being the Agnus Dei. A raised gilded text runs round the font. The carved corbels to chancel arch are angels playing harps and trumpets, which are gilded. The general carving, and font and pulpit, were executed from the drawings of the architects, by Mr. Charles Mawer, of Leeds; and all the interior carving is in Caen stone. The brass fittings were supplied by Hart, Son, Peard, & Co., of London. The general contractors were:—Mason, Thomas Burton, Methley; joiner, George Lockwood, Woodlesford; slater, Watson & Wormald; plumber, Joseph Lindley; painters, Wood & Son; plasterer, James Brantear, all of Leeds. The church is heated by hot water. The organ was executed by Radcliffe & Sagar, of Leeds. The cost of all, including organ, was 4,500*l*. The architects were Messrs. Perkin & Son, of Leeds.

Stourbridge.—St. Mark's Church, Stamberhill, has been consecrated. Mr. T. Smith, of Stourbridge, architect, prepared the plans for the church, with 400 sittings, which plans were adopted, and the estimates of Mr. Horton, builder, of Brierley-hill, were accepted. The cost of the work was estimated at under 2,000*l*., but the extra expenses attendant on the site, levelling, building boundary walls, warming and lighting, &c., brought the total to 3,000*l*. in round numbers. The memorial stone was laid by Lady Lyttelton in November, 1869. The fabric is of brick, with freestone facings. It has a nave with aisles, and an apsidal chancel, with vestry on its north side; five pointed arches on each side of the nave separate it from the aisles, which arches are supported by iron columns with Early English foliage on their caps. A clearstory of small cinquefoil windows ranges along at the spring of the nave roof, and the roofing throughout is of open timber-work, steeply pitched, and bound with iron rods to protect it from any settlement which might be occasioned to the building by the mines in the vicinity. In the aisles are single-light windows, while those of the apse are two-lights, the central or east window being of stained glass, by Messrs. Ward & Hughes, of London. It represents the Crucifixion and Resurrection, the Good Shepherd, and the Sower of the Seed. The other windows of the apse will, no doubt be, by and by, similarly adorned, and the blank walls beneath covered with a reredos and mural painting. The seats are of varnished deal and open, and red and blue tiles are laid on the floor. The principal porch is on the north side of the nave, and there is a door at the west end, and one to the vestry.

FROM IRELAND.

Dublin.—New offices have been built for the English and Scottish Law Life Assurance Company, at No. 41, Lower Sackville-street, by Messrs. Cockburn & Sons, builders, from designs by Mr. William Sterling, architect. The style adopted is Italian. The materials used are Portland and Bath stone. The treatment of the ground story was suggested by the advantages to be derived by the throwing back of the main offices from the footway, and thereby removing the officials from the noise and interruption attendant on being brought too close to a leading thoroughfare. The basement story is divided into well lighted and ventilated offices, to which a distinct entrance is gained by a flight of steps. This was effected by making four Doric columns of Portland stone support the main front wall, and thereby leaving a porch, within which the eastern windows of the principal offices and the hall door are placed. The chimneypieces, superb gas-fittings, grates, &c., were supplied by Messrs. Hodges; the encaustic tiles and embossed glass were procured at the establishment of Messrs. Sibthorp. The cost of the structure was 4,000*l*.

Holywood.—The *Belfast News Letter* reports the laying of the foundation stones of a Methodist church and school-house, in this small town. The new church is to be erected in the modern Gothic style of architecture, of fine red brick, with Scrabo string-courses or facings. It is to be 60 ft. in length by 40 ft. broad, and will accommodate 380 sitters. The fittings and internal arrangements are to be constructed on the most improved system. The cost of the building is estimated at 1,800*l*. The plans and specifications were provided by Mr. Jas. Kendal, the builder being Mr. William Nimmock.

Books Received.

A Book of Memories of Great Men and Women of the Age, from Personal Acquaintance. By S. C. HALL, F.S.A. London: Virtue & Co. 1870.

WHEN Mr. Carter Hall first gave the public, from a lecturer's platform, some of his recollections of the many eminent men and women he had known during a long and laborious literary life, we told our readers of the deeply-interesting nature of his discourse, and pointed out the exceptional circumstances which had enabled him to speak of so many with intimate knowledge. The lectures were elaborated, and were published in the *Art Journal*. Still finding favour, additional memories have been recorded the previous notices enlarged, and, illustrated with portraits and numerous other illustrations, they have now taken the shape of a beautiful volume, full of interest, and destined to live. Let us dip into it for a few quotations. Mr. Hall is always happiest when he is praising. Thus, when speaking of *Moore*,—"His stern independence might have yielded to temptations such as few receive and very few resist: he preserved it to the last, under circumstances such as any of his many great and wealthy friends would have called 'poverty.' Of luxuries, from the commencement of his career to its close, he had literally none. His necessities were at times severe, but they were never published to the world,—nay, were never obtruded even on those who could, and certainly would, have made them less. In all the relations of life he was faithful, affectionate, and considerate. 'At home' he was ever loving and beloved; there he was happiest by rendering his limited circle happy. Let it be inscribed on his tomb, that ever, amid privations and temptations, the allurements of grandeur and the suggestions of poverty, he preserved his self-respect; bequeathing no property, but leaving no debts; having had no 'testimonial' of acknowledgment or reward; seeking none,—nay, avoiding any; making millions his debtors for intense delight, and acknowledging himself paid by 'the poet's mead, the tribute of a smile;' never truckling to power; labouring ardently and honestly for his political faith, but never lending to party that which was meant for mankind; proud, and rightly proud, of his self-obtained position; but neither scorning nor slighting the humble root from which he sprang."

We read with regret that a marble slab recording the date of the poet's birth, and placed by Mr. Hall on the front of the house, No. 12, Aungier-street, Dublin, where the poet was born, has been taken down by the present occupant! It is just now proposed (let us say by the way), if a small sum of money can be raised, to erect a memorial window to Moore in Bromham Church, under the shadow of whose walls his remains, with those of his wife, now rest.

Mr. Hall records the burial of *Thomas Campbell*. In the Jerusalem Chamber, famous for centuries—memories inscribed on every dark oak panel of that solemn room for the mind's eye to read, they waited the coming of the dead!—illustrious mourners many of them, whose own resting-places were foreshadowed there under the fretted roof of England's proudest mausoleum of her heroes of pen and sword. It was a dark and gloomy day,—

"The sun's eye had a sickly glare."

There was solemn and impressive silence—every footfall had a sound—as they followed the poet Milman, who read the touching burial service for the dead. And in Poets' Corner they placed Thomas Campbell. A lengthened pause preceded the words, "Ashes to ashes, dust to dust;" there advanced from the throng a Polish officer, one of the many of his unhappy nation there assembled. He dropped upon the coffin-lid some earth gathered for the purpose from the grave of Kosciusko. The effect was startling; but it became a thrill—the hearts of all there present beating audibly—when immediately afterwards, as the venerable dean uttered the words, "I heard a voice from heaven," a thunder-clap shook the old Abbey—aisles, pillars, and roof. He paused; the pause continued full a minute, and as the awful sound subsided, the assembly heard the sentence finished—"they rest from their labours!"

"When I first knew *Thomas Hood*," says our author, "his star was but rising; when I saw him last, he was on his death-bed; his forty-six years of life from the cradle to the grave having been passed in so weak a state of health, that day by day there was perpetual dread that at any moment might 'the silver cord be loosed, and the golden bowl be broken.' Continual bodily suffering was not the only trial to which this fine spirit was subjected. The world heard no wail from his lips; no appeal for sympathy ever came from his pen; his high heart endured in silence; and, without a murmur of complaint, he died. Yet it is no secret now that for many years he had a fierce struggle with poverty; enjoying no luxuries and few comforts; his 'means' derived from 'daily toil for daily bread.' A skeleton stood ever beside his bed, mocking his 'infinite jest and most excellent fancy;' converting into a succession of sobs those 'flushes of merriment that were wont to set the table in a roar.' At the time when nearly every drawing-room, attic, and kitchen,—when every class and order of society was made merry and happy by the brilliant fancies and genuine humour of Thomas Hood, he was enduring pain of body and anguish of mind." Nearly all his quaint conceits, his playful sallies, and his sparks from words were given to the printer from the bed on which he wrote, propped up by pillows; continually, continually, it was the same, up to the day that gave him freedom from the flesh. Yet it was a genial and kindly spirit that dwelt in so frail a tenement of clay. Although his existence was a long disease rather than a life, he was singularly free from all cumbrance of bitterness and harshness. Feeling strongly for the sufferings of others, he was entirely unselfish, ever gracious, considerate, and kind. Though perpetually dealing with the burlesque, he never indulged in personal satire. We find no passage that could have injured a single living person. Never did his wit verge upon indelicacy; never did his facetious muse treat a solemn or sacred theme with levity or indifference.

Lady Morgan had an idea that she might be the means of bringing together in fraternal intercourse the aristocracy of rank and the aristocracy of talent on a more extensive scale than was possible in her *maisonnette*. We remember the occurrence, and must condense Mr. Hall's account of it. Mr. Mackinnon, of Hyde Park-place, had a large house, a suite of rooms capable of "entertaining" many, and, in partnership with that estimable gentleman, Lady Morgan's plan was to be carried out. He was to issue cards to ladies and gentlemen of his order; she to those who were eminent in literature, science, and art. The cards were printed accordingly. They expressed that Lady Morgan and Mr. Mackinnon desired to be honoured with the company of So-and-so, on the evening of Wednesday, July 16th. It was certainly somewhat startling to read the names thus joined; it was known that the one was a widow, the other a widower; and there was consequently no just cause or impediment why they two should not be joined together. "We received our invitation from her ladyship's own hands, and accepted it. On the evening of the 16th, we duly entered the drawing-room at Hyde Park-place. We heard titles of all degrees announced; but hardly a name eminent in literature, art, or science greeted our ears. There were present perhaps 200 people of rank, but, excepting ourselves and three or four others of our 'calling,' Lady Morgan had no followers to fraternise with those of Mr. Mackinnon. Speculation was in vain as to the cause of so appalling an effect. The lady was evidently irate; there was no way of accounting for the humiliating fact; and, as may be supposed, the evening passed off with amazing dulness, for the co-operation of no other lions had been sought."

A few days afterwards the mystery was explained. Mr. Mackinnon had agreed to direct such cards as were to go to his own friends, Lady Morgan undertaking the transmission of such as were intended to lure the magnates of her own craft. The cards, properly addressed, she handed to Mr. Mackinnon's butler for the post; but either that functionary forgot his duty, or grudged the postage: at all events, they were subsequently found safe in his desk, where they had been in comfortable seclusion from the day when Lady Morgan placed them in his hands.

Our author has a warm word for *Sydney Smith*:—"As he was one of the wittiest so was he one of the soundest, as he was one of the wisest so was he one of the best, of men. His censure was always generous, his sentences ever just. Prudent, considerate, charitable, and humane, he was the very opposite of those professional wits who seldom speak except to stab; of those political reformers who have no toleration for virtue—in adversaries; of those social ameliorators who are good Samaritans in *words*, omitting only the penny and the oil at the inn and by the wayside."

Speaking of the artists he has known, Mr. Hall sketches the position of painters at the commencement of his career and now. Forty years ago—nay, thirty—there was little or no patronage for native art. Portrait-painters, indeed, were rich; but historic painters rarely received commissions; and landscape-painters had their remunerative employment chiefly from the publishers, as illustrators of books. One of the greatest artists of the nineteenth century, Hilton, never had a commission, and did not sell six pictures of size all his life. Prout, Harding, Copley Fielding, Dewint, Barrett, David Cox, these are names of but a few of the masters in landscape art, who produced drawings which were paid for at the rate of little more than a shilling for every square inch. Leslie sold his picture of "Sancho and the Duchess," to Rogers, for 74*l.*; it was bought by a dealer, at the sale of the poet's goods, for 1,120 guineas. Wilkie's "Errand Boy," a canvas measuring 1 ft. 2 in. by 1 ft. 7 in., brought at Christie's the sum of 1,050 guineas; probably Wilkie received for it the odd fifty. Mr. Hall has done much to help bring this about, and artists owe him a large debt of gratitude.

We should do injustice if we did not mention that the value of the volume is greatly increased by the additional Memories of Mrs. Hall: the book is full of interest from beginning to end, and we cordially bespeak for it a large circulation.

VARIORUM.

We understand that the publication of the late Mr. Papworth's "Ordinary of British Armorials," which was suspended by a long and painful illness, is about to be resumed upon different terms under a competent editor; and that the new terms of publication will be such that even those subscribers who discontinued their subscriptions early will be able to obtain the remainder of the work at a reasonable price.——"The Children's Sunday Album of Short Stories for Sunday Reading," by the author of "A Trap to Catch a Sunbeam," &c. (Cassell & Co.), is a very pretty little book, and something more. To each of a hundred and eight engravings Mrs. Henry Mackarness has prefixed a fitting text, and appropriate little story, the whole to a certain extent connected. It is charmingly written, will give much pleasure to the little ones, and do a vast deal of good.——*The Publishers' Circular* for December (Sampson Low) is full of pictures from the illustrated books of the season.——"Everybody's Year-Book: 1871. This fourth annual issue of "Everybody's Year-Book" contains much useful and amusing matter. Besides the usual Almanac material, there is a great variety of tables, Parliamentary and other lists, postage regulations, &c. Amongst the more amusing matter are anecdotes and a collection of national and patriotic songs, including the English translations of the Marseillaise, the Rhine Watch, Fatherland, the Danish National Song, several American ones, and others,—the British, of course, inclusive. Although this is an extraordinary sixpennyworth, it will be all the more wonderful if it be in every respect accurate; and towards that end we may add an item of correction. The minimum fare for a cab, "if taken from a regular cab stand (*is not*) one shilling for any distance within and not exceeding *a* mile," as stated, but for any distance within and not exceeding *two* miles.

Miscellanea.

Newcastle Society of Antiquaries.—At the monthly meeting of the members of this society, held last week, Mr. Clayton read a paper, entitled, "Notes of a recent Excavation on the Roman Station of Cilurnum." Towards the close of the last century there was discovered in the station of Cilurnum (the sixth per lineam valli) an arched vault entirely underground, which was reached by a descent of stone steps, and its entrance was secured by an oaken door, strengthened by plates of iron. In connexion with the same station a building has recently been discovered, having a frontage of 86 ft., containing masonry of a very finished character, through which there are three openings or passages, each of them 13 ft. wide. Behind this front is a range of five apartments, in one of which the vault is placed. These passages, of 13 ft. wide, must have been used for chariots and horses, and not merely for the purpose of access to dwellings. It is not improbable, remarks Mr. Clayton, that this masonry was originally a part of a forum or public building, and the shape of the ground around seems to support that conjecture. Among the ruins has been found a considerable quantity of glass, the paucity of which in the ruins of Pompeii is another proof of the difference of climate, that of the Bay of Naples and the valleys of Northumberland. In one of the rooms, and in the vicinity of stones which had suffered by the action of fire, was found a considerable quantity of mineral coal, apparently deposited for consumption.

Income-Tax on Houses and Land.—The assessment to income-tax in Great Britain, under Schedule A (in respect of the property in lands and houses) in the financial year 1869-70, shows 34 out of the 40 counties of England assessed at more than a million sterling. The annual value assessed to the tax under this schedule in Middlesex amounted to 18,052,185*l.*; in Lancashire, 12,098,829*l.*; Yorkshire, 11,036,433*l.*; Somerset, 3,229,421*l.*; Warwickshire, 3,166,538*l.*; Staffordshire, 3,139,443*l.*; Gloucester, 1,929,005*l.*; Worcestershire, 1,713,189*l.*; Wilts, 1,654,206*l.*; Oxfordshire, 1,191,096*l.* In Wales, Glamorganshire was assessed under Schedule A at 1,084,440*l.*; each of the other 11 counties was under half a million, though Carmarthen reached 458,168*l.*, and Denbigh, 476,289*l.* In Scotland, Lanarkshire was assessed at 2,723,440*l.*; Edinburgh county, at 1,661,015*l.* Most of the counties show a larger value assessed than in the preceding year, but several show some decrease. By far the most remarkable difference occurs in the instance of Gloucestershire, where the value assessed under Schedule A was 2,580,572*l.* in the year 1868-9, and only 1,929,005*l.* in 1869-70; and under Schedule D, 1,627,789*l.* in 1868-9, and only 1,133,848*l.* in 1869-70.

Arbitrator's Award.—In the Court of Exchequer an application was made on behalf of the Ambleside Sewer Authority to set aside an award made by Mr. Hogarth, land surveyor, Kendal, on the ground that it had not been made within the prescribed time, and, further, that it had been made without notice having been given to the applicants so as to enable them to be heard or give evidence. It appears that, some time ago, the Sewer Authority, in carrying out some sewerage operations at Ambleside, carried two drains across a narrow grass-plot belonging to Mr. Sproat, who claimed 30*l.* as compensation for injury done. The Sewer Authority thought the charge excessive, and the matter was referred to two arbitrators, who, not agreeing, sent it finally before Mr. Hogarth. The latter allowed the agent of Mr. Sproat to put in documents, but did not extend the like privilege to the Sewer Authority, and assessed the damages and costs at 41*l.* 3*s.* 6*d.* The Court made the rule absolute for setting aside the award.

Falling in of the Ceiling of Staines Church.—A large portion of the ceiling of the parish church of Staines has fallen in. It was on a Sunday evening it fell, but after divine service. The huge flat ceiling was composed of plaster. Workmen are busily engaged in repairing it. The churchwardens, it is said, some months ago recommended the removal of this ceiling, to improve the ventilation of the church, of which many complain. Why not do it now, and not endanger the lives of church-goers any longer?

The Hydraulic Lift Graving Dock Malta.—The last of thirty-two presses belonging to the hydraulic dock now in process of construction at Malta has just been successfully cast at the Liverpool works of the contractors, Messrs. Emmerson & Murgatroyd. These presses or cylinders are cast perpendicularly and in one piece of 36 ft. in length and 14 tons in weight; and are especially remarkable as forming part of a dock admitted by engineers to be one of the most perfect applications of hydraulic power yet devised. For the vertical casting, a pit some 37 ft. deep was sunk in the red sandstone of the Mersey bank; in this was fixed the mould, or, as it is technically called, the casting-boxes; two ladles containing 10 tons of iron each were swung over the pit and emptied into the mould, the magnificent outpour of the molten ore being a sight worth seeing. All has gone well on each occasion. After four days' cooling, the columns have been cut the proper length, tested to a pressure of 30 cwt. on the circular inch, and stacked ready for shipment. Their surface is so smooth that one might think they were turned instead of cast; and the metal is so tough that the surplus ends, each weighing a ton or so, had to be turned down almost to nothing before they would break off.

An Agricultural Hall at Watford.—A building on the principle and for the various uses of the Agricultural Hall at Islington, has been erected in Watford, on a site near the High-street end of the Clarendon-road. The gateway for carriages is 16 ft. wide, and there is a side gate leading to a wide pathway for foot-passengers, which runs along the front of the building, communicating with Beechen-grove by gateway there. The hall faces towards the station, and has three entrances in the centre of the front, and a fourth in the side is arranged as an exit at the termination of all shows. The interior is, in the centre, 45 ft. high and 127 ft. 4 in. long. It is formed in three divisions, the centre being 52 ft. 8 in. wide, and the sides 15 ft. 8 in. The length is formed in four bays of 24 ft. each, and two of 15 ft. 8 in. This arrangement, therefore, admits of a gallery 15 ft. 8 in. wide round the entire building, and approached by spacious staircases. The architect was Mr. F. F. Peck, of London, and the builders were Messrs. Jackson & Shaw.

Worcester Guildhall.—At a recent meeting of the town council, the Mayor read the following communication from Sir E. Lechmere:—

"At a meeting held on the 30th ult., Sir E. A. H. Lechmere, bart., in the chair, for the purpose of considering the desirability of increased public accommodation in the Guildhall, it was moved from the chair and unanimously resolved:—'That in the opinion of this meeting the accommodation afforded by the various rooms in the Guildhall is insufficient for the public purposes for which it is required; and that, as the Corporation are now contemplating the restoration of the building, this meeting is of opinion that the present is a suitable opportunity to secure that accommodation, and would invite the Corporation to confer, through some members of their body, with a committee of this meeting, as to the possibility of some means being adopted for rendering the Guildhall more adequate to the increased requirements of the public.'"

The letter was referred to the Survey Committee.

Restoration of Exeter Cathedral.—The monetary difficulty with respect to the commencement of the restoration of Exeter Cathedral is at an end. The sum of 3,000*l.* was wanted to make up the 15,000*l.* required for the choir alone. The Rev. Chancellor Harrington has announced his intention of adding 3,000*l.* to his previous gift of 1,000*l.*, in order that the restoration might at once be proceeded with, in accordance with Mr. Gilbert Scott's plans. It is probable that the contract for the alteration and re-adornment of the choir will be signed shortly. What the cost of the restoration of the whole cathedral will be has not transpired, but it is sure to exceed 50,000*l.*

Compensation in the City.—On Saturday a jury awarded the sum of 13,500*l.* to the Merchant Taylors' Company, as compensation for a piece of land to be taken from them by the Metropolitan District Railway Company, under the powers of an Act of Parliament. The site was in Cannon-street, upon which it had a frontage of 55 ft., and near the end of Great Trinity-lane. The value at which it was estimated by the Merchant Taylors' Company was 41,304*l.*

Smithfield Church.—According to *The Rock*, the "Martyrs' Memorial" Church, near Smithfield, will be consecrated on the 30th inst. As much as 3,000*l.* is still needed to complete the building and leave it free from debt.

The Builder.

VOL. XXVIII.—No. 1455.

Sculpture in England.

THE object in selecting this subject for our remarks is to consider the present condition and future prospects of sculpture; and to inquire, without prejudice, whether the influences under which it is exercised are of a kind to insure its satisfactory development, in the sense of high-class fine art. If the inferior quality, generally, of modern sculpture were put forth as the reason for this inquiry, it might be objected that it was begging the question. It might be contended that the present state of the art shows no decline, and that, compared with its practice in other countries, the sculpture produced among us holds no inferior position.

Though this is not the question, yet, in order to avoid controversy on these points, it will be advisable to commence the inquiry in a wider field, and to examine, first, what is here intended to be implied in the term Sculpture, as a fine art; and, at a later stage, to consider its present practice and condition.

To argue fairly this question in both its phases, it will be desirable to establish at least two starting-points. One will be the standard by which the art is to be measured or judged, and the next to determine whether its practice is conformable to such standard. It will not be sufficient to inquire what the artists who exercise the art propose to do, and whether they fulfil this object, but whether the direction of their efforts is a right one.

Stated broadly, the function of sculpture or of the sculptor is to imitate objects by form, and the measure of success will be the degree of accuracy of the imitation. But this view involves only the most material or mechanical estimate of the art, and entirely excludes all consideration of its pretensions and mission as a fine art. The comparison to which it will be subjected, in order to test its claim in this latter sense, will be with those productions of art which, by the universal testimony and judgment of the best qualified judges, have been pronounced the most perfect examples of sculpture. These are the works of the sculptors of the fifth and fourth centuries before our era.

It may be objected here that this is an arbitrary limitation, and that the real standard is, or should be, Nature, not Greek sculpture. But Greek sculpture, in its best aspect, is taken merely as the truest and most faithful transcript of Nature in her highest perfection. The tests are therefore, after all, identical: Nature is still the standard; and the finest examples of Greek sculpture are the most perfect exponents of Nature in her happiest manifestations. Indeed, it is this admitted excellence alone that gives Greek sculpture its exceptional position as compared with all others,—a subject that might be usefully enlarged on, but which does not strictly form a part of the present inquiry. Taking this, then, as a ground of departure, it is to be seen how far modern sculpture may, when measured by such a standard, be considered to be in a satisfactory condition. Before drawing the conclusions to which the above remarks may be supposed at once to lead, it will be fair to take a more comprehensive view of the very important, and, indeed, vital question of imitation, as a, or *the*, function of imitative art.

If the practice of sculpture is confined simply to its material exercise,—that is, the reproduction or representation of objects by absolute form only, and not by the semblance of form, as in painting and drawing on a flat surface,—the only criterion of excellence in the art, whether it is exhibited in modelling or carving, will be the exactness or truthfulness of the representation. It will be estimated simply as an art of imitation, claiming no higher position than a mechanical exercise of skill. The greatest success in it will be attainable by any practitioner who may unite close observation with facility of hand in copying, and, so far, the whole and sole merit of the artist's production will consist in the scrupulous accuracy of likeness to his original, and quite independent, of course, of the nature or character of the object he may have taken as his model. The value or importance of the objects selected would have no place in estimating the merit of the art, for the lowest equally with the highest class of form would belong to the same category, the test of excellence being simply the more or less ability shown in copying. There has been a large and influential support of this exercise of art, in late times especially. The strength of the argument in its favour is in the unquestionable truth that where the very essence of imitative art consists in the conscientious rendering of an object, this quality should be insisted on as a *sine qud non*. It is in the application of this truism carried out to its extreme to all forms of art, that possible danger to sculpture may be apprehended.

Without at all impugning the essential value of the doctrine, it may be permitted to show in what way its extreme observance may act detrimentally to the interests of the higher forms and practice of the art under review. There is sculpture and sculpture. There is the mere bald representation of objects by form, the clever handiwork, it may be, of the mechanic, the modeller, or carver; and there is the mode of working out the same purpose, representation, which elevates the practice into a fine or refined art, and which stamps its author as a real artist. It is the non-appreciation of this distinction which must affect, more or less, the position of sculpture as a fine art. In the one case it is little other than a trade-calling; in the other it is an exercise requiring, in those who are to excel in it, in addition to the imitative faculty, the cultivation of the taste in selecting and adopting both subjects and forms for their art, and the intelligent treatment of these as modes of illustration and expression. Before entering upon these subjects of selection and artistic treatment, it will be necessary to consider the important preliminary question of the capabilities of certain arts, and the laws by which they are governed. Even as imitative arts, both painting and sculpture are limited in their power. The former, commanding a wide range, may represent certain objects, and especially aspects of nature, which are utterly beyond the reach of the sister art; but painting is equally powerless to make even her most happy and admirable scenes and effects complete by the accessories essential to their accurate reproduction. For instance, in the representation of a storm, painting cannot give the rush of the clouds or the noise of the thunder; nor in a waterfall or rippling brook the essential characteristics of movement and sparkle that give to flowing water its life and charm; nor in portraying the piping shepherd and his group of dancing nymphs, supply the tones of his tuneful reed, or the motion of the dancers, and the gay fluttering of their drapery. Still, lacking this, painting can effect what sculpture,—an art strictly of form,—has no means of attempting. Where the subjects chosen may be in themselves unattractive, possibly coarse and repulsive, painting has resources of a compensating character which are denied to sculpture. Such are colour, aërial perspective, atmospheric effects, chiaro-scuro, and picturesque accidents depending on time, as day, night, or dawn; these are, in the hands of the painter, powerful aids to give force to imitation, to gratify the taste of the lover of art in particular phases of practice; and last, not least, even to withdraw attention from what may be objectionable, in the subject represented, to passages of more pleasing character. How often the poverty of invention, or the meanness of the subject, or the faults of bad form and drawing have been compensated by the mastery shown in harmonious colouring, or the powerful effects of *chiaro-scuro*, need not be dwelt upon. Every student of art knows that endless examples of this exist in the paintings of the Flemish and Dutch schools especially.

Sculpture has no such advantages; and in discussing this art it is of the utmost importance that clear notions should be entertained of its capabilities, and of the laws by which its practice should be ruled. Its power is limited to representation by form, and form only; and the law by which the sculptor is, or should be, governed prohibits all accessorial assistance out of this pale of direct formal imitation. He may, by certain modes of treatment, increase his effects, and by skilful manipulation of his materials, by contrasts of surface-execution, and, within proper limits, by the imitation of various textures in the drapery, give both variety and force to the representation; but it must all be effected by form only. Attempts have been made to realise sculptural imitation by adding colour to the marble. There is no instance of its success, even were it a legitimate practice; but it is obvious that, however it may be exercised or advocated, it is not sculpture. It has passed into the category of painting, and, for the most part, bad painting. The best examples of this hybrid art—painted sculpture—are found in some Spanish works so treated; but here the characteristics of sculpture are so entirely subordinated to the painting, that they may be said to be absorbed by it; and, though the realism of the figures is even startling, for they look like living objects, the exhibition is rather suggestive of the toy-shop than of the labours of a real artist. At any rate, it is not sculpture pure and simple, and cannot be fairly judged as sculpture. Whether painters will allow such works to be considered pictures, and legitimate examples of their art, is a question that need not be discussed in this place.

Two eminent and popular sculptors of this age strongly advocated this practice, and introduced it occasionally in their works. One declared candidly his object was to give greater truth and completeness to the imitation; the other, a devoted disciple of the ancient Greek school of sculpture, professed to have adopted it because he had read or been told that the ancients coloured their sculpture. It is not worth while to argue the matter as respects the productions of these artists. Their fanciful practice had no marked influence on the art of their time, and neither of them has left any work so treated that can be referred to as even a partial success. With respect to the supposed

authority of the ancients for the practice, it need only be said that though it may have been done exceptionally, there is no evidence of its having been the custom of the sculptors of the best period of art to use it in their most celebrated works in marble. There are accounts handed down of accessories of barbarous finery being supplemented to votive and similar productions, where the richness of the material was supposed to give value to the work dedicated, or to express more prominently the devotion of the donors; but this affords no fair ground for saying that, as a rule, all ancient sculpture was painted. Such practices were, no doubt, common in the earlier ages and among barbarous nations, before sculpture took its position as a fine art; and in the decadence of the art,—and it is one of the proofs of decline,—it is known recourse was had to every kind of meretricious trickery by which the public fancy could be attracted; and painting, tinting, gilding, the use of variously-coloured marbles, and even real stuffs for drapery, entered into the sculptor's practice. But none of this was sculpture in its proper sense.

Assuming, now, in continuation of the inquiry, that the best standard of sculpture is to be found in the great schools of the fifth century B.C., and of which the most perfect examples may be seen in the British Museum, in the series of sculptures brought from the Parthenon at Athens, it will be useful to endeavour, in a few words, to define the principles upon which the art was then conducted. There will be less difficulty in arriving at a satisfactory conclusion here, because the problem can be solved by reference to existing authorities, the works themselves. The speculative opinions, as to probable dates, and schools, and subjects, propounded by *dilettanti* scholars and antiquaries (who, usually, have but little practical knowledge of art) are of no value here, where works are to be judged on their merits, and not on the archæological ground of their age or history. The requirements for this judicial power are an intimate acquaintance with the anatomy, character, and capabilities of all classes of human and animal form, a knowledge of the laws of beauty, and a power of appreciating various (purely technical) refinements of execution, which those only who have been educated in the practice of the art can thoroughly possess. With these qualifications, united with fine taste—a combination, it must be admitted, but rarely to be met with,—the judge will recognise in the monuments referred to the most perfect and the noblest examples of sculpture that have reached modern times. The main principles which seem to have directed the sculptor of the time, were, first, the choice or selection of the class of form best adapted to express the idea, or the subject conceived; and, secondly, the truthful reproduction of these forms. The æsthetic reasons for the selection of certain types need not now be discussed, but their consideration will be found of no small importance to the student who desires to extend his inquiry as to the causes of the superiority of Greek sculpture. The sculptures of the Parthenon supply the student with the following material marks of excellence,—material because the spirit and exaltation that gave the impulse to the authors of these objects of their veneration, the statues of divinities and heroes, cannot be realised, even faintly, in modern times, by any effort of the imagination. The material points, then, of value to the student are, first, the thorough knowledge exhibited of the construction of the forms, both human and animal, as shown in its external or superficial anatomy, and of the capability of action in the several forms; and next, the perfect organisation which is expressed in the beauty of these forms. Their further recommendation is the wonderful executive treatment of the sculpture, where may be seen the utmost care and refinement of surface-finish without littleness or sacrifice of breadth. But too generally the extremities of the figures have been injured, both by time and intentional ill-usage; but where the surface is perfect, the supreme mastery of all the legitimate means of producing the desired effects is as edifying as it is obvious. The large and noble treatment of the naked, enhanced by the skilful management of the drapery, wherever the two come into contact, exhibits the thorough acquaintance of their authors with all the available resources for giving increased effect by contrast; while the busy and varied action of human and animal life in the metopes, and more especially in the Panathenaic procession, supply the most valuable canons for the proper treatment of sculptural composition in relief. Again, the forms throughout, though selected for their normal excellence, and therefore free from all coarseness, exhibit the utmost truth to nature, even in the most minute particulars, as is seen in the care bestowed on the distinctive execution of flesh, bone, and tendon, in the human and animal figures. This refinement is especially observable in the heads of the horses, and in the treatment of the joints throughout this wonderful composition. It is to be regretted that, owing to bad arrangement, both as to position and light, these, the finest examples existing of Greek sculpture, can only be very inadequately seen and studied.

One cause of the beauty of the forms in the Greek sculpture may no doubt be attributed in great measure to the purpose to which the art was applied. It was essentially, it may almost be said exclusively, employed in the service of religion; for, even when the statues were not strictly representations of the divinities—as was the case with the *iconic* or portrait statues of those who had been three times crowned in the Olympic Games—yet, these latter, being dedicated with great honour and placed in the temples, partook of a *quasi* religious character. When Phidias and his contemporaries illustrated Greece with their performances, the appropriation of sculpture to the noblest objects was the rule. The study of the highest class of form was, therefore, essential to the development of the *idea* that the gods and heroes should be represented only under such types as would express the assumed perfection of the divine and heroic nature. And that this comprehensive *ideal* should not be lowered, it is remarkable that no portrait statues are known of this period. It was, no doubt, thought that this practice would have too much individualised the art, and interfered with the general normal forms, considered fitting and appropriate to the grandeur of an art devoted to the service of the immortal gods. In the subsequent periods of the exercise of sculpture in Greece, even as early as the fourth century B.C., the strict principle above referred to had ceased to direct the sculptor's practice. The greatest possible attention was still given to the truth of imitation, and to the refinements of execution; but the speciality of the great school which has stamped its character on sculpture, in the choice of the noblest class of forms, in all the varieties required for the illustration of the most elevated myths or histories, no longer constrained or exclusively guided the sculptor.

The first step in the deterioration of the *ideal* of sculpture was the change from the highest sentimental or religious art to its making its appeal to the sense. The nude female figure under the name of Venus or Nymphs, the young Bacchus, Cupids, and similar subjects of a sensuous character, and recommended by the most exquisite execution, were now the favourite objects of the sculptor's art. Soon after this, portrait was introduced, of which it is believed with good reason that no examples are known previous to the date of Alexander the Great. The moment this innovation was admitted, a deterioration or lowering of standard was inevitable. The new practice naturally attracted attention; and from its realism and the interest attached to portrait, from the appeal it makes to personal feelings, it soon caused a sensible diversion from the more limited, though noble application of the art. The particular and individual now began to occupy the attention of the sculptor, instead of, as heretofore, the general or normal; and as there was less occasion and temptation to study the nobler class of forms, a lower standard, both of art and of artists, supervened.

This is a part of the history of sculpture of great interest and importance. Here it is only cursorily glanced at, as one of the causes which affected the healthful progress of the art. It is curious, and should be instructive to observe, how rapidly after this sculpture declined in almost every particular that constituted its greatness as a fine art; and for this reason, the facts are here brought forward for the importance they have exercised on all subsequent attempts to restore a fine school of sculpture. The position of the art, from the time of Alexander the Great and the dismemberment of the Macedonian empire, has been uncertain and unsatisfactory. It has never been exercised on any general principle. The art has been practised to suit the varying fashions and tastes of the day, sometimes affecting and imitating the ancient forms, but without their spirit; sometimes busied with portrait; sometimes attempting the combination or adaptation of modern forms with ancient accessories; and sometimes only aiming to represent mere commonplace objects to catch passing attention and to secure patronage.

It is from this point, then, that the position and prospects of all sculpture have to be judged, since the period when the fall of the art in Greece became a fact; and when the Roman conquests suppressed the exercise of sculpture in what may be termed its native home. An extensive immigration of Greek sculptors into Italy then took place, and Rome itself was filled with artists driven from their country, who exercised their calling only in order to obtain a livelihood. It ceased to be practised on any higher ground than that of expediency.

It must, however, be admitted that works of great material excellence were produced at this time, and *replicas* and repetitions of celebrated statues were multiplied to adorn the public places and squares of Rome, and to decorate the palaces of rich nobles, whose patronage of the arts was, however, attributable rather to a love of display than to any remarkable sensibility to their value or beauty. This trade-exercise of sculpture prevailed with more or less activity during the reigns of the earlier emperors; but many anecdotes of the time show that there never was any great feeling for it among the Romans. The most favourable opportunity for its attaining a high *status* was at the date of the Antonines, and especially in the reign of Hadrian, but this passed away with that liberal promoter of art, and subsequently the interest exhibited in it by some few of the possessors of sovereign power was rather a fashion than a real art-impulse, and was confined to making collections of ancient statues for decorative purposes, and as objects of mere show. The position of sculpture as a fine art became daily more and more depressed. To follow its waning practice through the different phases of its decline, would scarcely repay the trouble. It is sufficient to say that, as a fine and noble art, such as it was in the age of Pericles, and under the direction of Phidias, Polycletus, and the great sculptors of the schools of Athens, Argos, and Sicyon, sculpture had ceased to exist. When it did rise partially from the abject state into which it had fallen, it scarcely could take any very high rank. The chief condition of its excellence, practice on the human figure, was denied it in the absence of all opportunity for its display. This great advantage could not be looked for in modern times, and therefore, to that extent, the excellent discipline and education afforded by study of the human form was lost both to the sculptor and the public. Among the Greeks, the people were not only accustomed continually to see this freely exhibited in the public games; but, from the care taken to develop the physical powers, they became competent critics and judges of what constituted the highest perfection of form.

It would be as inconsistent as useless to attempt now a return to the classical style of sculpture as it existed in ancient Greece, when none of the conditions essential to its success exist. Without public sympathy with its subjects, without that poetical impulse which gave life to classical invention, without education in the principles of beauty, and with the habits and feelings of a people inhabiting a cold, northern climate, utterly opposed, both from considerations of delicacy and comfort, to the exhibition of the undraped figure, no such restoration could be thought of as likely to have successful results. When occasionally such reproductions are seen, they are rather academical exercises than the expression of original thought or feeling, nor are they calculated to interest popular sympathies. However meritorious they may be, as imitations and reminders of Greek sculpture, they never can take other than a secondary position; and yet, in point of execution, the best of them are frequently as good as, and may be better, than the general run of the works of the Greco-Roman period. It is not their want of merit so much as their unreality, their being only imitation-art, that condemns such works to eventual obscurity and neglect.

But it is no reason because sculpture representing Greek myths and subjects, in the Greek mode, cannot be successfully revived in these days, that the art may not be practised in a manner to afford opportunity for very noble results. Recognising as a fact beyond dispute that in one important condition of excellence in sculpture,—the free treatment and exhibition of the nude human figure,—modern art is exercised

at a disadvantage, compared with its practice among the Greeks; and that this circumstance has interfered with a most important function of art,—that of educating the public to understand and appreciate the highest class of beauty, yet this drawback does not necessarily preclude sculpture from asserting itself, under other aspects, as an art of great power.

It is to this subject, of such vital interest to the life and success of modern sculpture, that attention will now be directed. But, as this part of our task will necessarily involve a survey of the productions of many widely-differing schools, its proper consideration will require more space than can here be given it.

ISAMBARD KINGDOM BRUNEL.*

A FAITHFUL account of the life and labours of Isambard Kingdom Brunel would constitute an important, though a brief, chapter in the history of Human Progress. The regard of the student, who has pondered the biography of the men whose memories are most illustrious, has been too often dazzled and perverted by the splendour of military success, or by the adroitness which has made the mastery of human weakness the stepping-stone to power, to wealth, and to fame. The men who have spent their lives in conflict with physical difficulties, or in the unremitting effort to penetrate the secret counsels of nature, are fewer in number, and more modest in the record they have obtained, than the host of the vulgar great. Yet what rightly-balanced mind can value the blood-stained laurels of Cæsar in comparison with the gifts won for, and handed down to, the entire human race by such men as Pythagoras, Archimedes, and Aristotle? In this noblest school of human intelligence Brunel was a hereditary pupil. A glance at what he actually effected, during a life as short, measured by years, as it was long, measured by labours, is enough to show that his name will hereafter occupy no inferior rank among the servants and the benefactors of mankind.

It has been with no slight anxiety that the small and rapidly diminishing number of those who had the advantage of personal acquaintance with Mr. Brunel, have looked forward to the appearance of his Life, written, as a maiden effort, by his eldest son. The charming volume in which Mr. Richard Beamish, well known as an assistant of Sir Marc Isambard Brunel, has told the story of the engineer of the Thames Tunnel, and of the block machinery of the navy, led some of us to hope that we should receive from the same facile pen a memoir of the noblest result of Sir Marc's care and labour—the cultivated genius of his son. The difficulties which lie in the path of a biographer, too profoundly interested in the character of his subject, are well known to all persons acquainted with literature. In the natural fear which a sensitive mind may well entertain of falling into that style of treatment which has earned for Boswell a spurious immortality, lies the danger of being driven to the production of a cold, bloodless, mechanical chronicle. It is, therefore, with no little pleasure that we find the volume before us such as in no way to lead us to regret the silence of Mr. Beamish. While speaking with a modesty—we may say a hereditary modesty,—which does credit to a biographer, Mr. Brunel has not been betrayed into the fault of lessening the grand outline of his father's character, although he may be said to have given it only *en silhouette*. His method has been safe, for it has been historic. It is from the works, and the letters, and reports of Isambard Kingdom Brunel that we are enabled, by his son and historian, to form some imperfect idea of what manner of man he was. When we look at a picture in which, not only has the author sought to "nothing extenuate nor set aught down in malice," but where thought and action are displayed with a very truthful simplicity, we are but the more convinced of the magnitude of a loss which none who knew the man have ceased to deplore.

The method of the volume, consisting of 568 closely-printed pages, is one suggested by the nature of the biography which it attempts to trace. A brief chapter is given to the early life of Mr. Brunel, involving, of necessity, some account of part of that of his father, especially with reference to that great sub-Tamesian work which as yet stands alone in the history of engineering. Mr. Beamish's life of Sir Marc Brunel is here quoted by that great inventor's grandson. (The two volumes,—the life of the father and of the son,—should stand side by side among the books of constant reference in the library of every engineer.) Fourteen chapters are then devoted to the successive works executed by Isambard himself, the history of the several undertakings being traced in clear and distinct order. While we have thus to travel more than once over the same ground, in point of time, a much clearer grasp of the subject is attained than if a merely biographical order had been followed; as in extracting the notes of a diary. We have then an important and valuable chapter on Mr. Brunel's professional opinions and practice; one, which we could wish had been much longer, on his private life; appendices, containing reports on two of the great points of his professional warfare—the broad gauge and the screw-propeller; and the essential, but too often neglected, labour of an index.

In a work, which we regret to find limited to a single volume, Mr. Brunel has not spared room for such a brief summary of his father's career as might find place in a biographical dictionary. From the materials which he has furnished, aided by personal recollections, we must therefore endeavour to present such a sketch to our readers. Yet let them remember that, high as the engineer must rank in the opinion of all competent to appreciate his merit, the man claims even a warmer tribute.

Like so many of those men to whose ingenuity England is in no small degree indebted for her mechanical excellence, Isambard Kingdom Brunel was of French blood. His father, Marc Isambard Brunel, was a native of Normandy. The grand old baptismal name, borne by the three generations with which the volume before us is concerned, dates from Carlovignian times; and is either identical with, or closely allied in its etymology to, that borne by the ancient Seigneurs de Bourbon, before that lordship came by marriage to the seventh son of St. Louis. Marc Isambard, a consistent Royalist, fled from the Republican terror. He settled in England in 1799, and, after some adventures of romantic interest, married an English lady, whose family name was borne by his son. The first great work undertaken by Sir Marc in this country was the machinery for making blocks, which he designed and erected for the Government at Portsmouth. He also designed suspension bridges for the Isle of Bourbon; and carried out the most important engineering work that up to his time had been attempted in England,—the tunnel under the Thames at Wapping.

Isambard Kingdom Brunel, only son of Sir Marc Isambard, was born at Portsmouth on the 9th of April, 1806. For a time he was a pupil in two schools in England, and for two years a student at the Collége Henri Quatre, in Paris; but the main part of his education was derived from the care of his gifted father, who taught him Euclid before he was eight years old. As early as the age of four, his facility in drawing attracted attention. From his seventeenth year he was regularly employed in his father's office; and before he was twenty, on the occasion of the sudden and alarming illness of his father, the works of the Thames Tunnel were left under his direction. He subsequently held both the nominal and actual post of resident engineer of the Thames Tunnel, up to the time of the suspension of the works in consequence of the irruption of January, 1828; by which disaster he was seriously injured, very narrowly escaping with his life. In 1831, he was appointed engineer to the Clifton Suspension Bridge, after a double competition, in which his design was preferred to that, among others, of the veteran Telford. In the same year, he made designs for docks at Monkwearmouth, a portion of which he commenced to build in 1834. In 1832, the directors of the Bristol Dock Company consulted him as to the improvement of their Floating Harbour. In March, 1833, he was appointed, by a committee formed of members of the corporation of Bristol, and of other public bodies of that city, engineer to carry out the project of a railway to London. He prepared the plans and surveys for this line; and out of fifty-four days' contest in the Committee of the House of Commons in 1834, eleven were occupied by the cross-examination of Mr. Brunel. The Bill, having passed the Commons, was rejected by the Lords; but received the Royal Assent on the 31st of August in the following year. From that time Mr. Brunel held a position second to no man in his profession. He constructed railways in England, Ireland, Italy, and India, to an aggregate length of upwards of 1,200 miles; one of his main lines extending from London to the Land's End, and another to the extremity of South Wales, at Milford Haven. From 1835, the year of the passing of the Great Western Railway Bill, to his death in 1859, he was also engaged in the design and execution of vessels which effected an entire revolution in ocean steam navigation. The *Great Western*, his first steam-ship, started on her first voyage to New York on the 8th of April, 1838, and struck soundings off Newfoundland on the ninth day, with nearly 200 tons of coal still on board. This was Mr. Brunel's answer to the "demonstration" by Dr. Lardner, of the impossibility of the undertaking. The *Great Western* had a measured tonnage of 1,340 tons, and a displacement of 2,300 tons. She was followed by the *Great Britain*, which sailed from Bristol for London in January, 1845. Her tonnage measurement was 3,443 tons, and her displacement, 2,984 tons. The third of Mr. Brunel's steam-ships, the *Great Eastern*, was launched on the last day of January, 1858. Her extreme length was 693 ft.; her breadth, 83 ft.; her gross tonnage, 18,915 tons; her displacement, at 30 ft. draught, 27,419 tons; and her nominal horse-power, 1,000 horses for the paddle engines, and 1,600 for the screw engines. Mr. Brunel was also the means, having been consulted, without receiving any fee, by the Board of Admiralty, of introducing the screw into the Royal Navy. He executed dock and pier works at Bristol, Plymouth, Briton Ferry, Brentford, and Milford Haven, between 1848 and 1857. The immense facility to be obtained in the conduct of traffic, no less than in the execution of works, by the use of the electric telegraph, was first grasped by Mr. Brunel; his plans embracing applications of this mode of communication reaching from the working of a railway to the steering of a ship. In a very different province, the water-towers of the Crystal Palace, 284 ft. high, were his design. To the questions of the best mode of rifling guns, of the construction of the most efficient floating batteries, and, we may add, of the improvement of explosive projectiles, he gave a degree of attention, of the fruit of which, most unfortunately, the Government neglected properly to avail themselves. It is not too much to say that, had Mr. Brunel lived and been consulted, such a disaster as the loss of the *Captain* could not have disgraced our Admiralty. More anxious to mitigate human suffering than even to improve the armament of the country, Mr. Brunel, from February, 1855, gave an unstinted amount of time and exertion to the design and erection of the Renskoi Hospital, on the Dardanelles; which rendered that establishment as superior to all previous buildings for the purpose, in minute arrangement of every detail no less than in general design, as was the case in regard to almost every subject to which the great engineer directed his conscientious and inexhaustible energy.

In 1858, Mr. Brunel was ordered, by Sir Benjamin Brodie and Dr. Bright, to spend the winter in Egypt. He returned to England in May, 1859, and in September of that year sank under an attack of paralysis.

The loss to the country and to the world, at the early age of 53, of a man who had crowded so much into the brief term of the third of a century, may be regarded as the penalty paid for the one great error of his life. Gifted with a frame that seemed almost unaffected by fatigue, Mr. Brunel allowed himself, for many years, neither adequate rest nor due relaxation. For nights together he frequently never went to bed. During the construction of the Great Western railway, on his journeys along the line, he was accustomed to make his appointments according to distance, without any reference to the hours of day or night. To a given point his horses would take him in so many hours; and at the time thus indicated, whether morning, noon, or night, those who had to transact business with him in the locality had to meet him. His only sleep, on these occasions, was taken in his carriage. It may be questioned, however, whether he did not in these journeys actually pass more time in slumber than when he kept his silent and industrious vigils in his house in London.

Connected with this unsparing devotion of the whole energy of the man to the calls of duty, must be remarked a special peculiarity in his mode of conducting work. Mr. Brunel's rule was to see to everything himself. It is no doubt true that, in almost every matter to which he bent his mind, he found how far and how

* The Life of Isambard Kingdom Brunel, Civil Engineer. By Isambard Brunel, B.C.L. London: Longman, Green, & Co. 1870.

feebly the best assistants that he could engage limped behind his own fiery and unexhausted energy. Yet his sound common sense,—a quality predominant, if any single virtue were predominant, in his intellectual organisation,—should have taught him that he was endeavouring to overpass the powers of human nature. Could he have ensured a century of life, without needing slumber or relaxation, he might perhaps have fully discharged the tasks which he so inexorably demanded from his brain. Thus, not only did he shorten his natural term of activity, but he inflicted on himself hours,—nay, years,—of acute suffering. He would work on, regardless of neuralgic pain under which most men would have sunk, deriving a strange solace from a constant use of tobacco that would have clouded any other brain. This incessant labour, this anxiety to see for himself to every detail,—prevented the formation of such an organised staff as would not only have lightened his labour and prolonged his usefulness, but, in some cases, secured greater success in the execution of his schemes. His assistants scarcely took the rank or shared the responsibility of those attached to other eminent engineers. Some of them were but incompetent men. The ready kindness of their chief screened their shortcomings, and made up for their imperfect work. But the result was, that, with the exception of the one assistant who latterly occupied a position resembling that of a chief of the staff, and, perhaps, one or two others, Mr. Brunel's subs were little more than clerks or inspectors. Indeed, in some instances, mere inspectors, by dint of minute and vexatious adherence to the letter of the very stringent specifications prepared by Mr. Brunel, made themselves persons of more importance than their commanders, and exerted a pressure upon contractors that had an unfavourable effect on the conduct of more than one important undertaking.

In his dealing with contractors, it may also be greatly questioned whether the position invariably claimed by Mr. Brunel did not involve a certain inconsistency. It was his will always to be absolute. With regard to his directors, his opinion was, that unless he possessed their entire confidence, they had better employ some other engineer. No one could hold a more lofty, or we think a more just, opinion of the duty he owed to his profession in this respect. But then, as between the directors and the contractors, he claimed to be the sole arbiter. He thus constituted himself at once executive and judicatory. His love of justice, no less than his mechanical genius, no doubt enabled him to fill this double *rôle* with a success which few men could hope to imitate. But still the question suggests itself,—Was it right for any man to be placed in such a position? Men of the highest authority have held that it was not. In the earlier specifications prepared by Mr. Brunel, arbitration by an engineer, to be named by himself and the contractors, in case of dispute, was provided for. Any attempt, however, to enforce these clauses was always resisted by their framer; and from the later editions of his general specification,—to the revision of which he gave continual attention,—these clauses were removed. It was his intent that his authority should be unquestionable. It was, there can be little doubt, not the vulgar love of power, but the desire that everything should be done in the best possible manner, that made him insist on this rule. His position was thus as exceptional as his genius; but it may be concluded that his hands would have been stronger, his comfort greater, and his valued life prolonged to the period due to his iron constitution, had he not so perseveringly accumulated all functions on himself. He might—and those who knew him best thought he could—perform *every* duty better than any subordinate he could find. But it was a fatal deduction from this premiss to hold that he could better perform them *all*.

Of the magnitude of what he actually effected, we have little space to speak. He doubled not only the speed, but also the convenience of transit, both by sea and by land. Alone among the great names of his day, he made provision for the requirements of the future. To make railway carriages broad enough, and steamers large enough, to convey, with increased economy, and at augmented speed, the traffic of the future, was but the outcome of his provident forethought. We are not about here to open the question of the broad gauge, which is very temperately referred to in Mr. Brunel's Life. But it cannot be doubted that the limit of the carrying power on the most busy narrow-gauge lines is now attained. Week after week we have fatal proof of this fact. We will not assert that a double broad-gauge line, if carried out according to Mr. Brunel's ideas, would do the work of a fourfold narrow-gauge line,—but, at all events, it would afford a much greater margin for the economical development of an increasing traffic. As to the size attainable by ocean-going steamers, Mr. Brunel fought the battle single-handed. There can be no doubt as to the victory he obtained.

No part of the volume before us is of more service in enabling the reader to form a correct view of Mr. Brunel as an engineer, than the patient and accurate detail of the launching of the *Great Eastern*. A painful, dim, suspicion that some unexplained want of success attended that unprecedented operation is dispelled by the simple record. We see what had to be done, what obstacles arose, and how, one by one, they were vanquished. The financial non-success of the atmospheric system is also fairly and honestly set before the reader. The only point in which we are disposed to differ from the author is, that we hold the opinion, which was shared by Monsieur Eugène Flachat, who gave much study to the subject in France, that the loss arising from the irresistible rush of caloric into the rarified air bore a much higher ratio to the leakage of the valve than Mr. Brunel allows,—that, in fact, the mechanical difficulty might have been surmounted, but that the physical difficulty was more serious. Nor does this physical difficulty appear to have been anticipated by any one.

We could wish that more space had been devoted to personal anecdote. Those who have been accustomed to regard the engineer of the Great Western as a species of ever active intellectual machine,—a man who lived only in and for the execution of novel and stupendous work,—have formed but little idea of the buoyant gaiety, the indomitable patience, the exquisite taste, and the inherent kindliness, of Isambard Brunel. His stature was low, but so knit and proportioned as to laugh at fatigue. The engraving, at the commencement of the Life, gives a somewhat conventionalised view of his face; the nose, especially, being too heavy. There is a very speaking photograph taken of him, as he leant against the chains employed in the launch of the *Great Eastern*; in which, however, the chimney-pot hat, of which he was a steadfast advocate, hides the perfect curve of the head. His eyes were rapid and piercing in their glance; and the modelling of his lips betokened a refined, and even an imperious taste. This quality found appropriate expression in his works. The old canal type of bridge, and the unrelieved shed roof, were thought adequate for our public works before Brunel introduced features as novel as they were striking. In the station at Swindon he first adopted a graceful Italian ornamentation, to displace the barrack style previously in vogue. In the Great Western Station at Paddington, he has produced by far the finest work of the kind in Europe; a building as superior to the unnecessarily costly wagon-roofs that disgrace the Thames-side stations, as it is to the carpenters' sheds at Euston-square. While turning night into day at his desk, he would find time to pick up a rare bit of china, or to floor an opponent in conversation by an apt quotation from Mr. Micawber. To these genial qualities testimony is borne, in the volume before us, by his old friends Mr. Burke and Mr. Hawes. His admirable qualities as a negotiator, and his unrivalled success as a witness, were well known. In cross-examination, he was unapproached. On one occasion the case of a line, which did not look very brilliant on the close of the examination in chief, was so thoroughly established by Brunel's replies to the opposing counsel, that he dryly remarked to that barrister, as the committee broke up, "So-and-So, our directors had better retain you to cross-examine me next time."

On one occasion only can we remember his having been taken aback. In 1852, during a visit to South Wales, his second son, a bright intelligent lad, who accompanied him, asked some question as to the Barlow rails, which were then being laid on that line. Mr. Brunel replied that they were an experiment. "What, papa," exclaimed the boy, "do you mean to say that all the South Wales line is one great experiment?" The engineer winced, and for once was deaf.

If one quality more than another should be held up to the admiration of those who would emulate the career of Isambard Brunel, it is his unhesitating, unfaltering conscientiousness. His moral courage scarcely fell short of his utter physical fearlessness. No toil was spared, no cherished project was clung to, when he found that fresh light was to be obtained on the subject. To arrive at the truth was his main passion, and for that reason he obtained a deeper insight into mechanical law and practice than almost any other man. His genius none can imitate,—it was the gift of God, and was the more remarkable from appearing in the second generation. But in patience, candour, energy, labour, command of temper, kindliness of disposition, love of justice, and regard for duty, he set an example all would do well to study. His character was one to be admired in all that was native, and to be imitated in all that was acquired. His monument is conspicuous in the noble works which he executed. His memory is dear to all who knew him. His biography, as published by his son, is a contribution of no ordinary value to our professional literature, and displays an instructive example of the manner in which the rarest natural gifts may be improved by the most unremitting culture. His remains rest, in "the holiest of our holy places," near the dust of those most famous in our history. It would be difficult to point out a tomb which commemorates the name of a more faithful and illustrious *Naturæ minister et interpres*.

ENGLISH AND WELSH ABBEYS, CASTLES, AND HALLS.*

If Mr. Pickwick, or the philosopher whom Sam Weller puzzled at Clifton with the intermittent gleam of his dark lantern, had proposed to himself to write a book upon the structural antiquities of their native country, it is possible he would have produced exactly such kindly, old-fashioned, unquestioning volumes upon the subject as the two that have just been completed by the well-known author of "The Curiosities of London," Mr. Timbs. The sceptical mote that appears in the modern antiquary's eye is not in his; neither is he afflicted with a subversive beam. The delightful old legends that engird so many of our ancient castles, abbeys, and manor-houses, have as fresh a charm for him now as they had sixty years ago; and he tells them with as firm a faith as though they had never been dissected on the library-table of the modern archæologist, and found wanting. It is no pleasure to him to detect the absence of a vertebra, and see the tremble and fall of the subject he is examining. He summons up his ghost-stories tenderly, and dismisses them with care. Let any one gainsay it who chooses, we were in need of such a work treated in such a manner. Already our lip-lore has decreased to a shred in these matter-of-fact days; and if we are to have nothing but winnowing and weeding of our old legends we shall some day find ourselves without any.

Mr. Timbs does not pretend to have visited all the buildings whose "popular history" he relates. Such descriptions of them as he occasionally gives are taken from accepted authorities, though, perhaps, in some cases, from authorities that were accepted in days when topographical surveys were rare. Hence, for architectural details we must not look. But as they are not promised, we cannot justly complain of their absence. Here and there this sketching in the library instead of upon the spot, however, leads to a little shortcoming in the matter of bringing down the history of a building to the latest events. Looking to the account of Stowe, for instance, we see Mr. Timbs says, by way of conclusion to his remarks:—"Of the many instances of fallen fortune to be found in human history, the sad fate of Stowe and its possessors presents us with the most melancholy lesson,—to lecture us with its fallen grandeur, and to impress us with the virtue of contentment, and teach us that 'not a vanity is given in vain.'" Now, if Mr. Timbs had happened to take a return ticket to Buckingham, he would have found that Stowe is in the process of rehabilitation, and is gradually becoming as well stored as it was before the memorable sale. Or, turning to Berwick, we find no word of the fact that the Castle has been displaced there to form the railway-station; or to mark there is nothing to indicate that the noble castle is down, leaving only a mound as its site. Similar want of

* Abbeys, Castles, and Ancient Halls of England and Wales: their Legendary Lore and Popular History. By John Timbs. London: Frederick Warne & Co., Bedford-street, Covent Garden. New York: Scribner, Welford, & Co.

posting-up in recent facts to be detected here and there might lead to the impression that the blemish was one that pervaded the whole work. This is by no means the case. In many instances Mr. Timbs has availed himself of the most recently published information. If not, he would have attributed the carvings at Chatsworth to Grinling Gibbons, as was formerly the rule, instead of the Watsons. And in the main, in his bright pen-and-ink sketches there is much to admire and be pleased with.

Mr. Timbs tells us that Harlech Castle was originally called Twr Bronwen, from Bronwen, the ancient British princess, who was the daughter of Llyr, and sister of Bran, the father of Caractacus. This would have been a good opportunity to relate what is known of the history of this "fair-breasted" beauty. The 51st of the Welsh Triads mentions that a blow given to her by an Irish Prince, Matholwch, was one of the three luckless blows of Britain, and the cause of war; and the Mabinogion records that she was buried on the banks of the Alaw, in Anglesea; and about forty years ago, on the banks of the Alaw, at a spot known as Twys Bronwyn, was found a square kist, with a funeral urn in it, supposed to be that of the princess in question, which urn is now in the British Museum. But our cheery and good-natured antiquary leaves the lady alone, and records instead the plucky defence of the old fortress by a Welshman named Dafydd ap Jevon ap Einon, in the fifteenth century. "I held a castle in France," said this brave Taffy, "till all the old women in Wales heard of it, and now I will hold this Welsh tower till all the old women in France hear of it." And so he held it through a long siege by the Earl of Pembroke; the earl's brother and a large force encircling it, and his garrison suffering fearfully from famine, till at last the most honourable terms were offered to induce him to surrender, and he gave up the castle, after keeping it for nine years, against Edward IV. Even his foe became his friend; and when Edward at first refused to stand by the terms he had made in his name, Pembroke swore, "Then I will put Dafydd and his garrison into Harlech again, and your highness may fetch him out again by any one who can; and if you demand my life for his, take it:" of which generosity we hope all the old women in France heard too. Silver-grey, wind-worn, and frayed are the remains of Harlech Castle, with Plantagenet shoulder-headed windows, and great pointed archways side by side, with narrow arrow-slits, scarcely 10 in. high, that were part and parcel of old Welsh valour; and between the castle and the sea lies spread a low, green, oozy marsh. Mr. Timbs thinks it "overhangs" the sea, as Bamborough and Dunstanborough, on the north-eastern coast, literally do; but there is this low-lying tract of marsh at the foot of the steep on which it stands. This little uncertainty about the site is, however, scarcely worth mentioning.

Mr. Timbs has gone over a field that is too vast to be minutely explored single-handed with complete success. If he has made slips that local historians can put their fingers upon, as when he gives Alnwick to the Percies by the exclusion of a natural son of Antony Bec, Bishop of Durham, he must, on the other hand, be accredited with great care, generally, and much taste. Here is a pretty landscape, with Ludlow in the foreground:—

"The old town of Ludlow,—in itself an object of considerable interest,—stands upon a knoll, and to the westward, on the heights of a steep line of rocks, rise the grey towers of Ludlow Castle, which at one time must have been impregnable. From this point the view is, perhaps, unsurpassed in all England. Eastward is Titterstone Clee Hill; on the north is Corve Dale, and a series of hills which stretch as far as the eye can see, the beautiful valley of the Teme lying immediately below you, with the Stretton Hills as a background; to the west is a line of forest; while, looking back, the Teme, prettiest and tiniest (in some places) of rivers, disappears in a narrow ravine, 'formed' (says a contemporary writer) 'by some convulsion of the ancient world, which cut off the knoll on which now stand the castle and town, and gave it its picturesque character.' So beautiful, indeed, is the surrounding country, that Ludlow has been called by an enthusiastic admirer (probably a Salopian) the queen of our inland watering-places."

Much in this manner, we are shown between three and four hundred remarkable places, famous either in song or story. This selection by no means exhausts our national store. In the provinces, some of his readers will consider their particular lions, which may be omitted, as worthy of recognition as others that are inserted. Northumbrians will miss Ford Castle, for instance, close to Flodden field, where James IV. of Scotland, "the champion of the dames," spent the last few hours of his life before the great battle, fascinated with the beauty of the wife of the owner, "Sir Hugh the Heron bold," as painted so gorgeously in Marmion; Bothal Castle, Chillingham Castle, Harbottle Castle, all famous, and Brenckburn Priory, among others. Durham men will look in vain for Lambton Castle with its legend of the famous Worm, or for Bishop Auckland Castle, now the residence of the Bishop of Durham, built by the fighting bishop, Anthony Bek, implicated in the transfer of the De Vescies' estate to the Percies, though not in the manner narrated; Warwickshire readers will consider Arbury Hall, with its ruddy and sunny courts and grey and green terrace, slighted; Kentish folks will wonder why Saint Radigan's Abbey was not added to the rest; and so on through the counties. We recommend the book as a pleasant, chatty companion for a leisure hour, that tells, agreeably, of many an odd and out-of-the-way place, as well as of the chief country seats of the ancient nobility. We have all read of hiding-places, recesses within walls, and of the magical appearance and disappearance of individuals upon the scene by their means; and here we are given minute particulars of two of the most remarkable halls containing them. Ingateston Hall and Hendlip Hall. Holy Sepulchres, i.e., the empty arched recesses in chancels, where, in old times, a crucifix or effigy of the Saviour was placed on the evening of Good Friday, have a chapter; Stamford Bull-runnings have another. Lady Godiva, Queen Eleanor, Arabella Stuart, Elizabeth, Queen of Bohemia, Amy Robsart, Tennyson's Countess of Burghley, and other dames of whom we are never tired of hearing, sweep across the pages; as well as more ghostly personages. The Boscobel Oak, beehive-houses, curious caves, celebrated fields, subterranean chambers, the Star-chamber, Avebury, Stonehenge, historical stones, such as King Arthur's Stone at Gower, rocking-stones, and the Stone of the Arrows, near Aber, where the old Welsh princes sharpened their spears and arrows, are, among miscellaneous matters, introduced, that do not come, strictly speaking, under the heading of abbeys, castles, or halls, and yet have stories belonging to them that are part of English history. They form, indeed, a relief to the scores of oak-floored and panelled chambers, hung with historic portraits, and enriched with coffered ceilings and carved chimney-pieces of ancient country-seats. We get tired of a noble avenue if there is too much of it; and it is possible to have too many haunted corridors, even though it be Queen Katherine herself, with her crown and train, that glides adown them, as at Kimbolton; and to meet with the same personages too often. Hence, it was wise in Mr. Timbs to sprinkle his spectres sparingly; and to interpose between the numerous halls and castles in which Mary Queen of Scots was confined, those visited by Cardinal Wolsey; these in which Queen Elizabeth was entertained; and those in which Charles I. and Charles II. met many of their fortunes face to face, some such contrasts as he has introduced. Even mysteries, like that of Minster Lovel, or myths, like that of Midridge, or the blind beggar of Bethnal-green himself, are welcome, after a long course of the last-named illustrious personages, unless, indeed, they are graced with startlingly new treatment.

Turning over page after page for a suitable specimen of Mr. Timbs's manner, we light upon this sketch of Fair Rosamond's Bower:—

"In the middle of Oxfordshire there existed from the Saxon times almost to our own age, a Royal palace, fraught with memories grave and gay, and chequered with light and shade of the most picturesque scenery. Not a vestige of the palace now remains; but its site is denoted by two sycamore-trees, whose wide and spreading limbs point amid the solid silence to the spot where kings in days of yore have dwelt. . . . The Bower, or Maze, which the king had built for Rosamond, consisted of vaults underground, arched and walled with brick and stone. It is thought to have existed before the time of Rosamond, and remained after her death, since all pleasaunces, or gardens, in the Middle Ages had this adjunct. . . . How the Queen discovered her is variously told. It is commonly said that 'the Queen came to Rosamond by a clue of threidde or silke, and so dealt with her that she lived not long after.'"

And then Mr. Timbs gives all the other versions of the story known, with an account of Godstow Nunnery, where some authorities state Rosamond was buried; while others affirm she lived as a nun for twenty years after her supposed death. Those who admire our ancient fabrics, and enjoy their legends, will find in the volumes he has prepared a large amount of enjoyment, and will unanimously admit that he has well carried out his object, which he avers was to add to the attractiveness of famous sites and scenes.

NEW BUILDING FOR THE POST-OFFICE, ST. MARTIN'S-LE-GRAND.

THE corner-stone of the new building for the General Post-office, in course of erection opposite Sir Robert Smirke's building, in St. Martin's-le-Grand, was laid on the 16th inst. by the Chief Commissioner of Works, Mr. Ayrton, M.P.

It is stated that the new building will be of four stories, and have four fronts, two each 286 ft. in length—one towards St. Martin's-le-Grand, and the other in Bath-street; and two each 144 ft. long—one in Newgate-street and the other in Angel-street. It will be faced with granite to the height of 5 ft. above the pavement, and the superstructure will be of Portland stone throughout. The first two stories will be ornamented with Doric pilasters, and the two upper stories with Corinthian pilasters. The principal or centre entrance, in St. Martin's-le-Grand, will consist of a Doric portico, surmounted by columns and an entablature of the Corinthian order. The estimated cost of the structure is 129,700*l.* odd. It is being erected by Mr. William Brass, contractor, of Old-street-road, from designs by Mr. James Williams, architect of the department of the Board of Works. The erection of the edifice is under the superintendence of Mr. Trickett.

Mr. Ayrton, in his address, said the new building would be a remarkable illustration of the advantages to be derived from the study of economy, combined with utility, in the erection of a public building. He was happy to add that no edifice had been recently designed in which so much convenience and accommodation would be obtained from so small an expenditure of the public money; yet consistently, at the same time, with such an amount of ornamentation and elegance as was requisite in a public building of that importance. Undoubtedly, it would not present what some people would call the grand features they might expect to see in a public edifice; but it should be borne in mind that the department with which he was connected was not engaged on this occasion in erecting a Grecian temple, but a place of business; and therefore it had sought to subordinate architecture to convenience. However desirous people might be to encourage mere beauty, his department was bound to remember that architecture was not to be regarded as the master of the public, but rather its servant. It might, indeed, be compared to a handmaid of fair proportions ministering to the wants and luxuries of her mistress; but when worshipped, it becomes an inexorable thing, compelling every one to submit to its dictates.

Mr. Ayrton is right in principle, but he must not push it too far. "Fitness, Commodity, Delight," is the order in which the purpose of a building has been wisely stated. The authorities, who ignore the last quality altogether will stand but ill with posterity. Moreover, beauty is not necessarily costly:—

"Taste, never idly working, saves expense."

It is scarcely to be denied that the design of the New Post Office, as published, is of a commonplace type. Unless good architectural skill be brought to bear on details, the general proportions, and the profiling of mouldings, we may have a damaging eyesore that will last long years.

THE STATE OF THE STONE RELICS ON IONA.

MR. JAMES DRUMMOND, R.S.A., read a paper, entitled "Notes of Early Monumental Art in the West Highlands," at the last meeting of the Society of Antiquaries of Scotland. He visited Iona, and found the stone relics in a sad state of neglect and decay; indeed, some of them he did not find at all. They had actually been claimed by various persons, on one pretence or another; one because his grandfather had paid seven bolls of barley and seven milk cows for it,—to whom is not said, and no one had any right to sell it:—

"Now, surely [says Mr. Drummond] this system of appropriation ought to be put a stop to, and that by the strong hand; for it is an utter impossibility that the monuments of these old chiefs and ecclesiastics can be the property of these people, many of whom hardly belong to the island. No better illustration could be given of the utter indifference and carelessness, not only of custodiers, but of all connected with this neglected region, whose duty it is to protect from destruction these precious illustrations of monumental art of a bygone time, than the M'Leod memorial stone, over which the turf was allowed to grow; and so thick was this covering, that the very position of it was forgotten; and yet this was one of the interesting and most perfect remaining. Close by this I

uncovered another, over which the turf had been allowed to grow. On it is a cross, a sword, and the usual scroll work. It has often been asked—Is there no way of preserving these invaluable relics? I should say no difficulty whatever, seeing the old order has been departed from; and as no stone is now in its original position, there can be no delicacy in the matter if the powers that be would only move in the matter or sanction some scheme. In such affairs the simplest plan is always the best, and the object would be gained if a simple stone bench, about 1 ft. high and 2 ft. wide, were built round the inside of St. Oran's Chapel, and on this, ranged against the wall, the finest of the slabs, those of figures, being placed at the east end, and in front of all an iron rail, to prevent inquisitive people from meddling; but let no sacrilegious hand put a roof on this chapel, as has been proposed. Let the more common specimens lie still inside the barriers."

Mr. Drummond also visited and speaks of the remains in Cantyre and elsewhere.

PROFESSIONAL QUESTIONS.

NORTHERN ARCHITECTURAL ASSOCIATION.

The President of this Association (Mr. Thomas Oliver), in his opening address on the 17th inst.,* said:—Perhaps the most important duty that we have to accomplish—a duty that underlies the entire ramifications of our professional practice—is that of securing public confidence. It would be useless to shut our eyes to the events of the last few years, whether caused by the short-sightedness or conservatism of metropolitan practitioners, or by the craving for change, or the want of information on the part of the public; but to all observing minds it must be evident that a change for the worse has taken place in regard to this most desirable state of things. It is said the late Prince Consort remarked on one occasion that he could get along well enough with civil engineers, but when he came to consult with architects, they almost invariably threw obstacles, such as precedent, in his way. And our present Government has certainly shown in most arbitrary terms and actions their unequivocal intention to throw over precedent, both in the appointment of their professional advisers and in regard to the established customs of such advisers. The cause of this, like the cause of the terrible war now raging on the Continent, will very probably ooze out, bit by bit, as personal quarrels, secret negotiations and apprehensions of individual aggrandisement, develop themselves, through blue-books or otherwise, to the outer world. To ignore the fact, however, will not meet the case; we must meet it face to face. If we have habits to throw off, let us do it manfully; and if we have habits to learn, let us set to work to learn them cheerfully. This, however, we must have, and that is, that the public shall believe in our honour and good faith; shall have confidence in our capability to perform what they require, and shall implicitly trust our word as regards the expenditure of their funds.

Behind the cloud, however, there is even here the silver lining. The public have confidence in our taste. Royal engineers may possess constructive talent "almost amounting to genius," as Mr. Cole remarked of the designer of the hideous structure for the last Great International Exhibition, in Cromwell-road; or ephemeral architects of the Paxtonian school may giantise their one idea, and take the world aback for the moment; but in all cases the cultivated and life-educated architect has to be called in, either to give the artistic touch or illuminate with brilliant colour the ill-proportioned blocks of material, and transform them into that subtle and beautiful thing recognised by all cultivated minds as architecture.

There are two questions at the present time agitating the architectural profession, the first, though least in importance, being the ownership of drawings; and the second, the diploma question.

The question regarding the ownership of drawings involves the question of copyright. As there is no law in our favour, as in the case of book-making and picture-making, those engaged in palace, church, or house making must, I suppose, be content to have their ideas plagiarised, until architecture, as an art, and its application into original forms, becomes looked upon by the public as an invention. Have I not as much right to take out a patent for my original designs for baths and wash-houses, or model chapel design, or convalescent home design, as the person who builds a turret war-vessel, and sells it to the Government; or the person who makes a steam-engine, and disposes of it to a railway company; or a person who makes a chimney-pot, a washing-machine, or a porcelain bath?

The question of the ownership of drawings, however, has two or more phases, two being at the present time prominently before the public.

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The architect, in furnishing to the builder selected by his client, which every architect must do, a copy of the whole of the original drawings and details to work from, actually gives to the manufacturing agent of the proprietor that which he seems to consider his right, viz., the drawings that are practically worked from; and surely if the architect chooses to keep his own copy, the proprietor has no right to claim that copy as his also. Such is the fact, however, and such is the claim that is being made. Doubtless many of the builders' drawings get destroyed and lost, but this is through no fault of the architect. Suppose an architect did not furnish a copy of the drawings, but sent his office copy out for the builder to work from, what position would the proprietor be placed in? The whole of the drawings might be lost, in case of dispute. They could not help being damaged; and as documents forming the most important part of the contract, they would be entirely at the mercy of a too deeply-interested party. I need scarcely say that nothing but confusion would be the issue. Again, if an architect has to give up his own copy of the drawings to the proprietor, in addition to the copy given to the proprietor's contractor, he would, for his own almost necessary future use, have to prepare another copy, making in all three copies, which, I maintain, his present commission or charge would not permit of his doing to be remunerative to him.

* At this meeting, a paper, by Mr. F. R. Wilson, "On Old English Statutes" (to which we shall return), was read. The election of officers also took place. Mr. Wilson, Alnwick, was elected president; Mr. M. Thompson, vice-president; Mr. James Hogg, treasurer; and Mr. F. Charlton, secretary.

ON A NEW METHOD OF PRODUCING DURABLE MURAL PAINTING BY FICTILE VITRIFICATION.

This was the title of a paper read at the Society of Arts, by Mr. Alan S. Cole, on the 14th inst., when Mr. Ayrton, M.P., presided. We must confine ourselves to that portion of it (and the whole was very interesting) which describes the new mode. Mr. Alan Cole said,—

A somewhat new process is now in use by Messrs. Minton, Hollins, & Co. and Messrs. Maw & Co. It is remarkable, as the tesseræ are mechanically produced. The idea of these tesseræ originated with Mr. Prosser, and was worked out by the late Mr. Herbert Minton. They are made by compressing into metallic moulds powdered clay with such a force that the atoms of the clay bind themselves together, and retain the shape of the moulds sufficiently that they can be manipulated and carried to the kilns, where, once fired, they become homogeneous and imperishable bodies. The colours given to these tesseræ are, in the main, produced by metallic oxides, principally oxide of iron. The scale of them is limited to a certain extent, though much progress in making new colours is being effected by Mr. Michael Hollins, head of the firm of Messrs. Minton, Hollins, & Co. To this kind of mosaic I propose to give the name *opus anglicanum*. I believe this term has been applied to certain English needlework. I think it is more appropriately applied to mosaic work than to needlework; so that I trust that some other name may be given to the needlework, as a confusion of names is always to be regretted. And now I get to Mr. Campbell's process, which I suggest should be named *opus fictile pictorum*, and considered as a sub-section of the *opus anglicanum*.

To Mr. Arnoux, the scientific juror and reporter upon pottery shown at the various international exhibitions, I am indebted for many most valuable explanations and notes upon Mr. Campbell's invention.

Adopting the principle of the late Mr. Prosser, in 1840, to which I have alluded, Mr. Campbell produces tesseræ, by compressing a composition of stone and clay into metallic moulds. I have here specimens of such unfired tesseræ. By this means the greatest economy in time and in workmanship is insured. By using ordinary clay in a plastic state, several days must elapse before it becomes dry enough to be placed in the oven. The advantages of this system of compressed dry pulverised clay are so manifest, that it has quite superseded the former modes adopted for the making of tesseræ or tiles. These compressed tesseræ are then removed to the oven, where, by virtue of the components of the material, they become vitreous bodies.

The hexagonal shape was adopted in the first instance at Mr. Ayrton's suggestion. The agglomeration of a regular hexagon produces a network of lines generally accepted as being more pleasing in effect than the union of squares.

Plaques may be formed with facility. These plaques are of small and convenient size, thus rendered free from the ordinary risks of firing large plaques. In the first instance, the tesseræ are cemented at the back by a species of mortar, and then fired. This operation concluded, their surfaces are covered with a stanniferous flux, which fills up any spaces which may occur between the tesseræ. Again, they are fired, and upon issuing from the oven are ready for the artist's use. I must here tell you that each individual tessera is a vitrified body impervious to any effects of damp. These tesseræ cemented together therefore produce plaques whose nature as one body is identical with the imperishable nature of each of its tesseræ. The cements at the back and the flux on the surface cannot be injured by any atmospheric effects. Thus, I repeat, the plaques are, so far as science of the present day can teach, perfections of imperviousness to any evil effects from damp, dirt, gas, &c. Now, by placing the plaques together, it is obvious, for the artist who likes to have a large space before him, he may thus obtain an acre of tesselated canvas to work upon if necessary.

The artist can make his preliminary blocking-out or sketch with charcoal or pencil, and with the same ease as he effaces his work from canvas can he rub it off the Keramic plaques. When he has completed his sketch, he may then proceed to the colouring of his composition.

The detrimental effects of light upon vegetable colours, the hurtful results of the exposure of colours composed of metallic oxides or their salts, to the action of oxides of carbon, of ammoniacal gases, sulphuric acid, sulphurous acid, and carburetted hydrogen, precluded the adoption of such materials. The use of the various essential oils and varnishes seemed likewise forbidden by the well-known volatile character of such fluids.

Again, the mural paintings, by means of mineral colours, worked with alkaline silicates as a pigment (such, for instance, as have been tried in Berlin some twenty-five years ago), require for their execution considerable practice and study, and a delicate manipulation. This process cannot be said to have yet received the sanction of time, and it appears they have already suffered from their exposure to the atmosphere; at all events, it is not proved that they can resist the action of the nitrate of potash, which the capillary attraction of the wall is sure to bring to the surface.

Thus it will be seen that there seemed to be obstacles in the way of the right species of colours to be used; however, Mr. Campbell's resources have enabled him to contrive a complete palette of vitrifiable colours almost quite similar to the ordinary oil colours. The artist can apply them to the plaques in precisely the same way as he would oil colours to his canvas. The plaques, when painted, are fired, and upon withdrawal, should the artist desire to make alterations, he can do so by painting in his corrections, which may be fired into the composition. The number of firings is quite immaterial, and may be multiplied without damage to the plaques. If you will examine the finished specimen exhibited, you will see that the actual strokes and touches of the artist remain as they do in oil paintings. The texture, if I may so call it, is identical to that of an oil painting. Herein, therefore, is a most valuable feature.

I wish to make one remark upon the durability of the colours. Their nature, like that of the tesseræ, is vitreous. By the heat of the kiln a fusion between the colours and the plaques takes place. The vitreous components in both combine, and the result is an endurable and impervious work.

I would sum up, therefore, the virtues of Mr. Campbell's process thus,—permanent painting, upon a true and level surface, illimitable, if necessary, in its size.

A very valuable discussion followed, in which Mr. Cope, R.A., Mr. E. M. Ward, R.A., Mr. Poynter, A.R.A., Mr. Redgrave, R.A., Mr. J. G. Crace, Mr. Westmacott, R.A., Professor Donaldson, Mr. Fisk, Mr. Hyde Clarke, and the Chairman took part, and which want of space alone prevents us from reporting.

WORK, WORK, WORK!

CIRENCESTER SCHOOL OF ART.

AT the distribution of prizes, last week, in connexion with this school of art, Mr. S. C. Hall delivered an excellent *extempore* address to the students, a portion of which we report. Never, he said, let your time be idly spent when it can be profitably employed. Take my advice,—work, work, work. Consider that idle time is not only evil in its influence and effects, but leaves a seed that will surely have as pernicious fruit as any evil planted on earth can have. My lads, you must consider that every hour of your time, that you can spare from your employment, you must apply to art, which is profitably spent, and not only for its immediate gain, in furnishing and strengthening your minds, but in the actual profit to be obtained at no distant period. Remember that he who is intelligent is sure to make better progress than the man who is stupid. Remember the great advantages foreigners have over us, which is attributable to the education they receive in the art departments, and which is profitable, not only for enjoyment, but for actual pecuniary advantages. The skilled workman is a better workman than he who is unskilled; and his master can afford to pay him a much larger sum than to him who works without intelligence. If you had been through the French manufactories, as I have been, you would have seen that the meanest artisan knew perfectly well what he was about; he was not a mere mechanic, to copy slavishly what was submitted to him, but he thought and considered, and the result was a better design in taste, form, ornamentation, and colour. They produce a better design than we do, with all our energy, and under circumstances always more favourable, excepting that they understand what they are about, whilst we labour on in ignorance of the principles required. It would be only going over the old ground again to tell you that in every position of life art has its charms. There is no man so utterly uncultivated—not even the savage—who does not derive some enjoyment from art. It is the highest recompense of civilisation as it is the largest reward to the uncultivated. But if enjoyment was the only object of art, it would but accomplish a very small portion of its task. It is a very great pleasure and a great teacher, and whether found in the palace or cottage it is sure to bring recompense with it, whenever encouraged. I trust that these boys, however humble, surround their rooms with bits of art, which indeed are silent but valuable instructors. They can easily acquire that which, when I was a boy, cost pounds, for perhaps pennies. Some of the most beautiful engravings are now to be had almost for nothing. I ask you to look at a publication called the *British Workman*, which contains some of the most beautiful works of art. Some large prints in it are so excellent in drawing and engraving that no money can produce better work. You can have to-day the best achievements of the painter multiplied by the engraver, which in my young days were confined only to the wealthy. Get them then, I say, in the name of goodness; surround yourselves with these beautiful things so easily to be obtained. I have every reason to congratulate my countrymen on the change that has taken place in England during the last thirty years. These schools of art are certainly the main instrument to achieve that high and holy purpose which no other science can fulfil; and let us promote it by every means in our power. When you place an illustrated book, or print, before any of your young people or children, you know as well as I can tell you that you are thereby cultivating a taste not only to soften and elevate the mind, but to have an additional comfort and advantage for them. How many of your cottages are decorated with these silent instructors? Show me the cottage that contains some half-dozen or more of these prints, which are to be had for almost nothing, and I will show you a better master of the household, and mistress, too, be it in ever so poor a cottage,—in other words, I will show a father and mother more fit to bring up children than are to be found in many circles of higher society. What influences a desire to enjoy home more than cultivating a love of art? Art is a public instructor, aiding in the virtues taught by the Holy Book. One of the best auxiliaries which a clergyman can have, when he puts a Bible in the hands of his flock, is a love of art. One art will assist others, and it will lend its influence towards virtue, equally with as good effect as any of the teachings a good clergyman can give us. Be not under the impression that you can learn without work, that a lesson is to be acquired without labour: you must do that which other men have done whoever achieved eminence in any position, in any grade or calling. You must remember that toil is the only road to excellence, and that to achieve success you must labour to earn it. My young friends, bear in mind,—and I leave it to you as my legacy,—to work, work, work, with thought; cultivate your intelligence, and do not be satisfied simply to use your hands; but use your brain and cultivate your mind, and you may be sure that the more you think over these subjects the more you cultivate art. I impress upon you to labour to attain eminence in it; the more surely you will be laying up for yourselves prospects of happiness hereafter, not only in the actual recompense distinction will bring to you in the reward of a pleasant and profitable science, but in the reward of your conscience in feeling that you have done that which you ought to do, and to which it has pleased God to call you. I know that among you there are many who are the sons of men in trade here, in this town of Cirencester; I have been told of this and that person whose father and other members of the family are working in trades, and who can only be spared occasionally,—perhaps not for more than an hour in the evenings; but in that time they have undoubtedly shown the good results of work. Well, then, make the most of that time, and be assured that if you do not accomplish all you desired to accomplish, and rise to that eminence which some of your young men have attained at Kensington, each will have his reward according to his degree of merit,—will have a recompense for his thought and labour, well employed and well bestowed.

IN *RE* YEOVIL.

TYPES OF CIVILISATION.

"A WORKING MAN" furnishes a Crewkerne local paper with some fever facts about the villages of Chinnock, and asks what the Nuisance Committee of Yeovil are about? He says:—

"The cottage in which Robert Lacey lives, and where he has lost his wife and one child, besides having had another child and himself attacked very severely, has no less than five privies and a pigstye all within a few yards of the house! One of the privies at the back is touching the house, and has an open cesspool. It is no wonder, therefore, that fever should break out in such a place. It cannot be supposed that the medical gentleman who attends the place has not reported this state of things in the proper quarter. Out of the five cottages at Quarry Farm, three have had fever in them. None of these cottages have back doors, and they are built against a damp hedge. They cannot be healthy, as it is impossible to wash the floors. There are also two cottages at Richay, not far from Lacey's cottage, which are a disgrace to the parish on account of the shameful state in which the poor occupants are allowed to live year after year. They do not appear to have been repaired for thirty years. I venture to say that children who have to live in such wretched places cannot help unlearning what they will learn when put to school. What is the Nuisance Committee of the Yeovil Union doing that some step is not taken towards the spread of this fever? Perhaps, by and by, when some of the richer inhabitants of the place are attacked, some stir will be made."

We may add that the three villages of Chinnock East, West, and Middle, require looking after. They have never, to our knowledge, been long free from disease and sickness; the habitations of the poor out and about the parish are not much better than pigstyes. A little distance north of East Chinnock is the notorious and unfortunately-situated village of Chiselborough, which attracted so much attention some years since. The inhabitants are affected by maladies which are said to arise from the defective ventilation and the mild climate of the neighbourhood. In the year 1851, in a letter to Lord Ashby, Dr. Guggenbühl thus described the inhabitants of the village of Chiselborough:—"Three German feet high, corpulent and bloated, with misshapen heads, turgid lips, and noses flattened like the negro's." Whether the situation of the village in a narrow valley, inclosed by lofty hills, has such an effect on the temperature of the climate, and, in turn, so affects the villagers of Chiselborough as to produce the maladies known as goitre and cretinism, we are not prepared to say. But with the additional evils and surroundings that such homes as those which the villages of Chinnock and those in the Yeovil district exhibit, we fear that these repulsive peculiarities will not soon wear out. Dirt is the parent of many crimes, and badly-housed human nature cannot improve in physical strength or moral power. There is no standing still; mankind must either go on improving or deteriorating. Pure air, pure water, in sufficient quantities, and comfortable and well-constructed homes, are the very least requirements that are absolutely necessary for the health and existence of civilised human beings.

THE "CRITERION TAVERN" COMPETITION.

MESSRS. SPIERS & POND proposing to build a tavern and restaurant on a plot of land in Piccadilly, just past the Circus, with a frontage of 79 ft., and extending through to Jermyn-street (a depth of 151 ft.), where the frontage is about half that in Piccadilly, graciously permit fifteen respectable architects, selected from a longer list of suing applicants, to arrange plans and prepare designs, in hope of being appointed to carry them out. In the basement, or lower, the instructions say, there is to be a hall capable of holding 1,000 people, with a gallery and a stage; on the ground-floor, a buffet and dining saloon for 150 people; above these must be a grand hall and orchestra for public meetings and concerts, and the top part of the building is to be prepared for a photographer, and have a fine-art gallery. The cost is to be about 20,000*l.*, exclusive of decorations and fittings. The premiums offered are:—150 guineas for the first best, 100 guineas for the second, 75 guineas for the third, 50 guineas for the fourth; and all the rewarded drawings are to be the property of Messrs. S. & P. No design is to receive a premium unless a contractor will undertake to carry it out for an amount within 10 per cent. of the architect's estimate. The Firm may reject the whole as not meeting their views (their decision is to be final and conclusive), or they may take from one to four of the designs at prices named above and hand it or them to their own architect to carry into execution. If, however, they should think it expedient to select one of the competitors so to act, he is to receive a fee of 1,000*l.*, for which he is also to supply drawings for the decorations, any premium to which he might have become entitled merging into that amount.

This is all very unsatisfactory. We have no desire to find any fault with the respectable firm who have made the offer, and who, as times go, will probably be thought liberal; but look what it really means. By fully carrying out their offer of premiums the proposers may obtain four complete sets of designs and estimates, the pick of a picked fifteen, for much less than they would have to pay any one of the competitors, if employed in the regular way of business, for a single set of designs and estimate,—for less, indeed, than any properly-qualified respectable surveyor would charge for legitimately making an estimate of the cost of carrying out one of the designs selected; and yet there are fifteen architects, or firms of architects, who think themselves lucky in being allowed to buy a ticket, and at a heavy price, too, in this lottery, which, after all, if Messrs. Spiers & Pond please, may be a lottery of all blanks.

DISTRIBUTION OF PRIZES, SOUTH KENSINGTON.

THE Lecture Theatre at the South Kensington Museum was well filled with the pupils and their friends on the 16th inst., when Sir Francis Grant, P.R.A., distributed the prizes to successful art students of the South Kensington District Schools. Mr. Barchett, the head-master, read a report, and called up the students one by one to receive the rewards obtained:—

"Since the last distribution of prizes eight students had been recommended from these schools for admission to the Royal Academy, and a total of twenty-two had been admitted by drawings made in these schools. Besides the regular prizes and distinctions, occasional prizes had been offered by the department and by manufacturers during the year, some for general competition, and some only for this school. By the Department 22*l.* were offered, in eleven prizes, for fans, the competition being limited to female students. Eleven students of this school competed, sending in fifteen designs, and Misses Montalba and Brooks obtained the first and third prizes, to the value of 7*l.* The Worshipful Company of Plasterers offered prizes of 25*l.* for designs for a 'capital of a pilaster' and a 'diaper for wall decoration,' limiting, however, this school to one subject. Two students, Messrs. Galt and Marshall, obtained the prizes of 8*l.* 8*s.* and 5*l.* 5*s.* respectively. A prize of 5*l.* was offered by Mr. M'Crum, of Milford, Armagh, Ireland, for designs for table damask. For this there were twenty-six competitors and thirty-four designs. The prizes were won by Messrs. Marshall, Wilson, and Nunn. Prizes of 2*l.* 2*s.* and 1*l.* 1*s.* were offered for the decoration of a tramway car. Thirteen designs were made, and the prizes were obtained by Messrs. Claussen and Harris. A steady and progressive success continued to mark the career of the school in which these honours and rewards had been won."

The gold medallists were Mr. A. F. Brophy, Mr. G. Claussen, and Mr. T. M. Rook; and two of them had won gold medals on the last occasion. The prizes presented to them were large shields in electrotype; and Mr. Cole, C.B., explained that an arrangement had been made whereby the successful gold medallists were at liberty to have an electrotype copy of that great work of art, the shield purchased at the Paris Exhibition by the State. Mr. Redgrave, in the course of some remarks, pointed out that the judges, in making their awards, did not look so much at the finish of any works as their truthfulness to art principles. He reminded the students of the coming Exhibition, and urged them to prepare works for that.

Amongst the lady students Miss Kate Karr, Miss M. Mansell, Miss E. Montalba, and Miss F. L. Sothern, took silver medals.

Sir Francis Grant, in the course of an earnest address, with which the proceedings closed, spoke of the coming exhibition of works of the Old Masters at Burlington House as being likely to exceed in value and interest the first. In past times England had certainly lagged behind the nations of the Continent in taste and skill, studying the useful to the neglect of the ornamental, but things were now changing. He had been greatly pleased with what he had seen in the schools, and more especially to observe that painting in monochrome had not been lost sight of.

BURLINGTON HOUSE.

On turning over the leaves of a book, entitled, "Round about Piccadilly and Pall Mall," by Henry B. Wheatley, and published during the current year,—a book as amusing for its fiction as for its facts, I find at page 67, in an elaborate, but by no means accurate, account of Burlington House, the following extraordinary jumble:—

"Samuel Ware, the architect of Chesterfield House, who had been apprenticed to a chimney-sweep when a boy, was the architect employed by Lord George Cavendish."

The nobleman here referred to was Lord George *Henry* Cavendish, who came into the bulk of the fortune, about 800,000*l.*, of his relative, Henry Cavendish, the chemical philosopher. With this handsome sum, although not stated in the book, his lordship acquired Burlington House, about the year 1818, and determined to restore it in a thorough and princely manner. For this purpose, he certainly did select Samuel Ware, F.R.S., F.S.A., &c., surveyor to the Duke of Portland, and architect to the Duke of Devonshire, who frequently employed him at Devonshire House, and at Chiswick, but never at Chatsworth, where Wyatville ruled the day. So much for the fact; now for the fiction. Chesterfield House was built in 1748, long before Samuel Ware was born, or thought of. This is admitted at p. 205 of the same work, where Isaac Ware is stated to be the architect. But how about the jumble? I have read the paragraph quoted over and over again, and for the life of me I cannot make out whether the author intends to convey the idea that "Samuel Ware," or "the architect of Chesterfield House," was "apprenticed to a chimney-sweep, *when a boy!*" But in faithful remembrance of my past master, Samuel, I beg most emphatically to deny that such apprenticeship refers to him. He was the son of a leather factor in St. John's-street, having a handsome villa in Southwood-lane, Highgate, and associating with the Longmans and other wealthy members of his class.

By dint of great talent, industry, and excellent judgment in his investments, Samuel Ware accumulated a large fortune, the bulk of which he bequeathed to his nephew, Mr. Charles N. Cumberlege, who has assumed the name of Ware.

If old Isaac Ware, whose folio on Palladian Architecture I well remember, was ever among the sweeps, and dancing on May-day, I should like to know. I do not believe it. I cannot conceive how a mind so brought up should be able to design and carry out such a beautiful work as the façade of Chesterfield House, which even Samuel in all his glory never accomplished. Can some of your readers enlighten me on this point?

Samuel Ware had the good taste not to meddle with the architecture of the grand court of Burlington House, or with the Piccadilly wall, except putting a new iron railing in front; but he reconstructed the back front, put on a new roof containing numerous bedrooms (not shown in Mr. Wheatley's engraving), and altogether spent about 50,000*l.* on the works. The grand staircase was wholly his, the proportions of which have been much spoilt by the present R.A.s; so also were the ceilings, decorations, and gilding, which I refer to because the author actually states that they were so well done by the original architect, about 120 years ago, that the learned society which took possession of the grand ball-room was agreeably surprised to find that the gilding only wanted a little cleaning to bring it out as fresh as ever it was in Lord Burlington's time.

Can any one imagine that Lord G. H. Cavendish spent so large a sum and contented himself with whitewashing his ceilings? No. They were Mr. Ware's. So were the chimney-pieces and stoves, the carved doors, pediments, skirtings, shutters, &c.

It is not correct to state that Mr. Ware's first proceeding was to take "*sketches*" of the house. Every architect will see that this is an absurdity. The most accurate plans, sections, and elevations were taken, and are still in existence, in possession of Mr. C. N. Ware, who, I trust, will present them to the Institute.

Burlington Arcade was a "happy thought" of Mr. Ware's, though not for the purpose of giving employment to young females, as stated. It was designed solely with the object of shutting out the hundreds of windows in Old Bond-street, which flanked the whole extent of the gardens, destroyed their privacy, and created an intolerable nuisance. The outlay amounted to about 30,000*l.*, and the first letting produced his lordship 14 per cent., besides curing the evil of which he complained. Drawings were subsequently made for the erection of a solid screen wall on the east side of the garden, in order to shut in the windows of the chambers in the Albany; but, after many interviews with the parties interested, this scheme resulted in a compromise, whereby the Albany retained some light and air, but no possibility of view over the ground, and his lordship avoided a large, unproductive outlay.

Henry Baker, F.R.I.B.A.

EXHIBITION IN AID OF THE FRENCH PEASANTRY.

We mentioned the endeavours that were being made to collect works of art as contributions in aid of the distressed peasantry of France. The collection is now on view in three of the galleries of the Society of British Artists, Suffolk-street, together with a number of pictures lent by the Queen, the Duke of Wellington, Miss Coutts, and others. Some of these are of rare interest,—"Christ on the Mount of Olives," by Raffaelle, and Lady Eastlake's "Virgin and Child," by Bellini, for example,—and the collection, as a whole, is remarkably interesting. Some very charming works have been given by their respective authors, and a large sum (above 1,800*l.*) has already been realised by sales.

THE STRENGTH OF SLATE.

Sir,—In reply to the inquiry of "A Mason," I should say that a good sound slate slab, of the dimensions given, and supported as described, would bear any weight that could practically be laid upon it. Experiments have shown that, to break slabs of equal dimensions, it required:—For Yorkshire stone, 2 cwt. 2 qr. 22¼ lb.; for slate, 11 cwt. 1 qr. 25 lb. Slate has also been found to bear a greater pressure than any of the granites. Although I have registered the results of many experiments upon rectangular slabs, I fear the problem now propounded is so difficult, complicated, as it is, through the slab being round, and a hole being cut in the centre, that no one could estimate the exact weight it would carry. To give some idea of the great strength of slate from the best quarries, I will quote one example. A 2 in. slab, 2 ft. 9 in. wide, with 2 ft. 9 in. bearing, was weighted uniformly, and the breaking-weight was found to be 9 tons 8 cwt.

Alfred Braby.

You printed in the *Builder* of last week the results I sent you of some experiments made on the strength of slate slabs. Allow me to apply them to the inquiry made by "A Mason." It was found that with slabs self-faced on both sides, the co-efficient *c* was 2·25; for slabs self-faced on one side, and planed on the other, the co-efficient was 2; and for slabs sawn out of a block, 1. There was a difference also in the strength of slate from different quarries, but those above given were of the strongest kind.

The practical conclusion I draw is, that if the slab of slate described be of a quality corresponding with the first of those above named, a safe load for it would be 18 cwt.; if with the second, 15 cwt.; or if with the third, 7½ cwt.

With materials of the strength of which we have extensive knowledge, as of timber and iron, a fourth, or even a third, in some cases, of the breaking weight may be a safe load; but with such a material as slate, it might not be safe to reckon upon more than a fifth.

C. S.

THE BLOCK-BOOKS.

As the many questions of interest connected with these celebrated books have once more attracted public attention, with a view, I trust, to their being finally settled, I have ventured to believe that notwithstanding the subject may be familiar to the greater number of your readers, there may nevertheless remain many among them to whom the "Block-books" still remain a mystery, and to whom, therefore, a concise explanation of their object and meaning, as well as the principal points in dispute relating to them, may be acceptable. For the purpose, therefore, of affording that information, I will now state what is meant by the term "Block-book," as well as mention the main questions in difference between the upholders of the old system and myself, and upon the correct solution of which the future position of the "Block-books" in literature will mainly depend.

A "Block-book" consists of an indefinite number of sheets of paper, upon which are impressions taken by means of a block of wood, upon the surface of which letters or engravings, or both, have been carved or cut, and from which, by pressure or friction, any required number may be printed at an exceedingly trifling expense.

The number of these books now known to us is very limited, and, with very few and trifling exceptions, they relate to religious subjects. The three principal and most important of them, however, are ordinarily recognised and described as the "Biblia Pauperum," the "Canticum Canticorum," and the "Speculum Humanæ Salvationis;" and whenever any difference of opinion has heretofore arisen in connexion with "Block-books," it has almost invariably been in immediate relation to one or other of these three works, which may therefore, for all practical purposes, be accepted as the representatives of the system of "Block-books," and by the true date of which, when ascertained, all the rest will necessarily be bound, as being altogether secondary to the principal works I have mentioned. So far I believe I am correct in stating that no difference of opinion exists; but here we reach the point of divergence.

The advocates of that I have called "the old system" have positively insisted that the "Block-books" are the production of the beginning of the fifteenth century (some of the most enthusiastic among them having, indeed, even ventured to declare they were known in the latter part of the fourteenth century), and that they consequently led up to and preceded "printing with movable types."

I, on the contrary, utterly deny this theory, and insist that printing with movable types preceded the "Block-books," as well as engraving on wood in Europe, and (notwithstanding the dates which appear upon certain of those "Block-books") I affirm that literature is unable to prove the possession of a single "Block-book" prior to 1486, in any of the numerous public libraries which then existed in Europe; without which proof I have (those which I believe to be) good and substantial reasons for utterly discarding all "dated" Block-books prior to the period I have named.

Thus this dispute now stands; and impugning the statements so promulgated by the professors of the old system, of which Mr. J. Noel Humphreys and Mons. J. Th. Berjeau are the latest representatives in England, I have, on such grounds alone, selected them as being among the best calculated to uphold it, and have therefore appealed to them to publicly state the authorities upon which they rely as a justification for the several positive declarations that "Block-books and wood engraving" preceded "printing with movable types," which appear in the works they have respectively published on the subject.

Henry F. Holt.

MR. EDMUND SHARPE, M.A., *Author of "Architectural Parallels."*

BEDFORD DRINKING-FOUNTAIN.

A handsome drinking-fountain was generously and unostentatiously given to the town of Bedford last week. The foundation consists of a bed of concrete, 18 ft. square, and 4 ft. deep; upon this are placed three tiers of York steps, the upper one forming a landing, 2 ft. wide, on which rests an octagonal basin, 9 ft. in diameter, cut and moulded out of Portland stone, with dog-troughs projecting from the sides, and from the centre of this basin rises the superstructure in Ancaster stone, which is designedly monumental in character, and 23 ft. in height, square on plan. This is intersected by an upper octagonal basin, 6 ft. in diameter, which serves as a filter, and divides the superstructure into upper and lower portions. Each side of the lower portion is formed into a panel, with moulded and crocketed gablets, enriched with ball-flower ornament, the apex terminating with richly-carved finials, and the bases united by deeply-cut foliated bosses supported on polished Aberdeen granite columns, with moulded bases and carved capitals. The spandrels of this compartment are filled in with diagonal diaper work. All the upper portions of the panels are ornamented with inlaid work, majolica tiles, and polished marble bosses. From the north and south panels project jets of wrought metal, to which drinking-cups are attached. On the east panel the following Scripture is incised:—"Jesus answered and said unto her, Whosoever drinketh of this water shall thirst again: but whosoever drinketh of the water that I shall give him shall never thirst; but the water that I shall give him shall be in him a well of water springing up into everlasting life." (John iv. 13, 14.) On the west the following Scripture:—"In that day there shall be a fountain opened to the house of David, and to the inhabitants of Jerusalem, for sin and for uncleanness." (Zechariah xiii. 1.) "And let him that is athirst come. And whosoever will, let him take the water of life freely." (Revelation xxii. 17.)

The outer edge and soffit of the upper basin is composed of a large O G moulding, decorated with cut pateræ and conventional carving. The upper portion of the monument is formed with panels, similar to the lower, with gablets, buttresses, and finials; the whole terminating in a pyramidal form, with handsome wrought metal finial. The water is laid on from the main with tin-cased lead pipes, and passes from the higher jets into the upper basin, where it is filtered, and thence through the lower jets into the large basin, and afterwards into the dog-troughs.

The whole structure is Gothic, and in character with the work of the fourteenth century, and occupies a prominent position at the south-east corner of St. Paul's-square. The total cost is about 200*l.*, which has been defrayed by a professional gentleman of the town. The architect is Mr. John Usher, Bedford. The mason, Mr. John Hinton; the plumber, Mr. George Small; the carver, Mr. Willis; and the metal-work is by Messrs. Hart, Son, Peard, & Co., London.

COMPETITION.

Gateshead.—In reply to the advertisement for designs for Gateshead Congregational Church and Schools, fifty-five designs were sent in, and the premium has been awarded to the one bearing the motto, "Labor et Spes," by Mr. Pritchett, of Darlington.

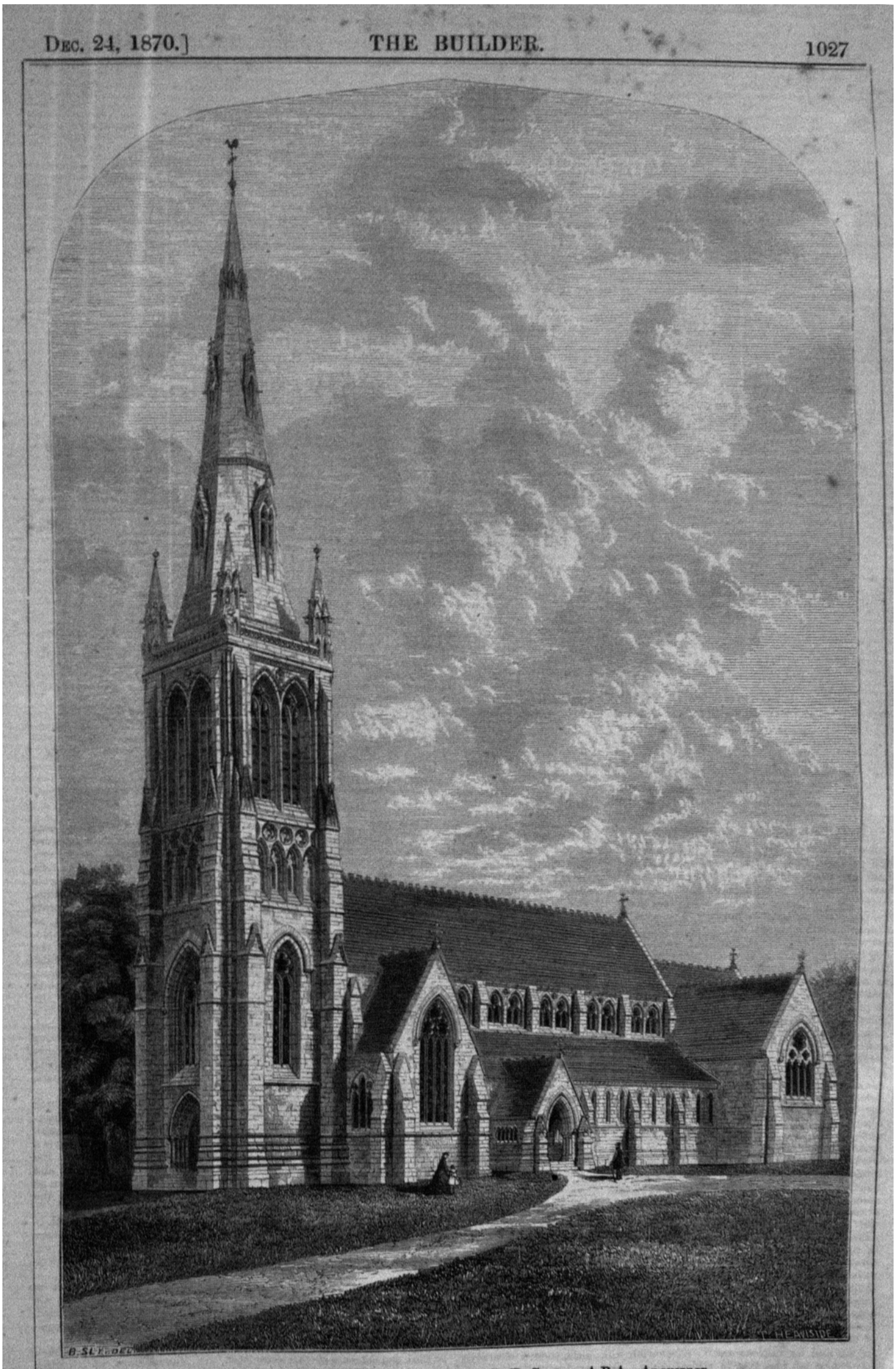
ST. PETER'S, BOURNEMOUTH.

St. Peter's Church, Bournemouth, has been built in the old-fashioned way of building by degrees. First of all, a south aisle was added to a poor modern chapel of ease, then a north aisle, then a clearstory so that the old chapel gradually disappeared. After this, in the year 1863, a very costly chancel with aisles was built. This is groined in stone, and has a sumptuous painted and sculptured reredos, the walls on each side of it being lined with charmingly-designed groups of angels painted on tile by Messrs. Morris & Marshall. On each side of the eastern bay of the chancel are double screens of marble and alabaster, which form two ranges of sedilia. The two aisles on each side of the choir seats are occupied by lofty metal screens, which, as well as the chancel screen, are the work of Mr. Leaver. In the wall on the north side of the chancel is a sculpture of the Crucifixion, whilst opposite to it is a sculpture of the Annunciation, and over the vestry door another of the Charge to St. Peter. The vestry, on the east side of the north transept, is three stories in height, with a newel staircase. Below is the heating chamber, on the church level the clergy vestry, and above this the choir vestry. Almost all the windows throughout this part of the church are of stained glass, and most of them executed by Messrs. Clayton & Bell.

Latterly it has been found that the church was not large enough, and an addition of a somewhat novel kind is now proposed by the architect; viz., a western transept, beyond which is a steeple. The steeple is already built up to the top of the tower, at a cost of about 4,800*l.*, and the western transept will, it is expected, soon be built, so as to connect the steeple with the church. The tower is 25 ft. by 25 ft., and 103 ft. high to the top of the parapet. The height of tower and spire will be 188 ft. The lower stage is groined in stone, and the belfry is being provided with a heavy peal of bells, cast by Messrs. Taylor, of Loughborough.

A large churchyard cross, with sculptures on the base, and a lych-gate, of stone and oak, are also being erected in the beautiful churchyard. The extreme length of the church, when complete, will be 180 ft.

The contractors for the tower, which is now just completed, are Messrs. Dove, of Islington. The whole of the work, with the exception of a portion of the south aisle wall, has been done from the designs of Mr. G. E. Street, A.R.A.



ST. PETER'S, BOURNEMOUTH.——MR. G. E. STREET, A.R.A., ARCHITECT.

REFUGEES' BENEVOLENT FUND.

WE have a very strong impression that England has now done enough in aid of the wounded victims (French and German) of the war. Probably not less than 400,000*l.* has been sent out of the country for this purpose, in one shape or another. Some of it has been wasted or misapplied; but much misery has, nevertheless, been relieved by its means; and what have the sacrifice and our neutrality brought us from abroad? The abuse, if not the hatred of both countries. However, we have done our duty, and that may be our reward. An enormous amount of distress exists in our own country, and we ought now to look at home. If Germany and France are insane and wicked enough to go on cutting one another's throats, on them the punishment must fall. We advocate no further subscriptions of money to send abroad. We would say one word, however, in favour of the fund originated by Mr. Francis Bennoch, to aid those refugees who have reached this country. Great distress prevails amongst them, and we shall be glad if we induce any of our readers to assist the society. Would that England could see her way to any steps likely to bring about peace. As "F. B." writes to us, and we endorse:—

O Europe, lift your mighty voice,
And bid the carnage cease!
From out thy sea-walled citadel,
O England, plead for peace!
Plead for the helpless, homeless ones,
Childhood and hoary years;
Plead for the orphan's piteous cry,
The wailing widow's tears!

Republic, Council, Kaiser-King,
Forget not this DECREE!
Each loving life your lust destroys,
Heaven will demand of thee!
Command, O GOD, Thou King of Kings!
Break angry passions down:—
That PEACE, and LOVE, and BROTHERHOOD
May all the nations crown!

THE PLANNING OF SMALL HOUSES.

ON two recent occasions have the weaknesses and discomforts of the small suburban houses been pointed out in your columns. It must not, however, be overlooked that with such meagre materials, and in such a restricted area, it is a very difficult task to attain under such unfavourable circumstances to a favourable result. Where in another case a foot or two of space either in contraction or augmentation is of no account, and the occurrence of an unpremeditated vacuity may be easily shaped into a useful cupboard, in this it means discomfort and an unprofitable space. There, a not altogether unwished-for superfluity of service may make the condensation of work, or the amount of it, immaterial; here service is an encumbrance, and its amount and economic condensation are of the utmost importance.

The hindrances to perfect planning are not diminished if we have to design, in addition for "one (according to "S. H."), who, in spite of moderate means, must and is determined to be a 'gentleman.'" In fact, in the whole range of architects' duties, I know of none more difficult than this undertaking. Another cause of failure is that the solution of this difficult problem is attempted by those who, from their associations and training, are not competent to decide on the specialities of a "gentleman's" abode. In these small houses, to insure domestic comfort the isolation of the service is of even more importance than in larger houses, where it can be placed at a distance. The unpleasantness of constantly crossing the path of a cantankerous cook with a month's warning, and at such close quarters, is very great. Nevertheless, I think the attempt to improve this class of house should be made, and, were the result satisfactory, would pay well. The plans are only measurably and not sufficiently studied in its relation to the frontage, and the capability this affords even by a slight extension of enhancing the comfort of a house. A piece of ground is parcelled out into plots, with frontages, say of 15 ft., 25 ft., or 30 ft., why not into ones of 17 ft. 6 in., or 28 ft., or 31 ft., if by so doing an uncomfortable house could be rendered comfortable? The increase in the ground-rent would be unappreciable. Property would become more valuable if greater brain power were expended on it, than if the value be measured by the amount of bricks and mortar, &c., that has been accumulated on it. Most of these plans seem to have been projected on india-rubber, and by the application of an ingenious process exhibited a few years since, by a more or less amount of stretching, may be made to do duty now for a 25 ft., now for 35 ft. or 40 ft. frontage, as desired. The moderation in the amount of rent one wishes to incur depends not on the simplicity of your demands, but on the amount of discomfort you are willing to put up with in living in the reduced rooms and offices of a larger house. Man differs from the lower orders of creation in nothing more than in this, that whereas the type of dwelling of these has ever remained stationary, and has never varied from that form dictated by their original instincts, that of man has developed concurrently with his progress from having had everything originally but size in common with the inferior creatures, it has arrived at such a phase of development that every function, meal, duty, pleasure, business, originally carried on in the same space, has now its separate sphere. The utilitarian has developed into dining and breakfast rooms, &c.; the ornamental or social into drawing, ball, and music rooms, boudoirs, picture and sculpture galleries; business into study, library, offices, &c.; the claims of decency into numerous bedrooms; the primitive fire-heat for household purposes into the kitchen, with its elaborate apparatus for cooking, scullery, and a host of subordinate offices. As regards the preservation of health, from no sanitary regards or conveniences into w.c.s, soil and water drainage, baths and washhouses, infirmary, and so on. Now a man, in building or choosing a house, should clearly indicate to what extent he wishes this principle of development to be carried out in it, beyond what the requirements of our social life now absolutely demand. For example, if he be a man with a large family and moderate means, or of moderate means without the large family, he will require but the simplest utilitarian accommodation; with more means more of the social and ornamental will be required; and so on for a variety of combinations to suit every degree of taste from simplicity to luxury, which wealth or its absence might dictate. What I would, therefore, advocate would be, to start from the cottage and develop it to a greater or lesser extent to suit the purse or the requirements of all, in preference to contracting a larger plan in its rooms and offices, and squeezing us all indiscriminately into it. We should then have some diversity and variety in domestic life instead of the present uniformity. What wonder, indeed, there should be uniformity: we live in similar houses, among similar furniture, in similar rooms with the same patterned paper; read the same papers and books from the circulating library; all come home by the 4·40 or 5 o'clock train; in fact, we do our utmost to make one the counterpart of another. J. I.

GENERAL CONDITIONS FOR BUILDING CONTRACTS.

AT a meeting of the London Builders' Society held December 20th, 1870, it was unanimously resolved as follows:—

"That the members of this Society do agree that after the 1st of February, 1871, they will not tender for any works in competition, the quantities of which have not been taken out by a surveyor agreed upon by the builders, at a meeting of the competitors.

They further agree that they will not sign any legal contract for works obtained in competition that does not contain a full and fair arbitration clause.

They also agree that no contract shall be undertaken by any one of them which has been declined by any member of the metropolitan building trade, on account of its containing inequitable conditions, unless the committee of Builders' Society shall decide that the objectionable condicions may reasonably be assented to.

That the general conditions for building contracts, based on the agreement of this Society with the Royal Institute of British Architects be recommended for general adoption."

The general conditions are subjoined.

1. The contractors are to provide everything of every sort and kind which may be necessary and requisite for the due and proper execution of the several works included in the contract according to the true intent and meaning of the drawings and specification taken together, which are to be signed by the architect and the contractors, whether the same may or may not be particularly described in the specification or shown on the drawings, provided that the same are reasonably and obviously to be inferred therefrom, and in case of any discrepancy between the drawings and the specification the architect is to decide which shall be followed.

2. The contractors are to conform in all respects to the provisions and regulations of the Metropolis Local Management Act and the Metropolis Buildings Act, and to the regulations and by-laws of the Metropolitan Board of Works and of the local authorities, and they are to give all notices required by the said Acts to be given to any local authorities, and to pay all fees payable under any of the said Acts to any such authorities or to any public officer in respect of the works.

3. The contractors are to set out the whole of the work and during the progress of the works to amend on the requisition of the architect any errors which may arise therein, and upon request are to provide the necessary appliances or furnish the necessary vouchers to prove that the several materials are such as are described. The contractors are to provide all plant, labour, and materials which may be necessary and requisite for the works, all materials and workmanship being the best of their respective kinds; and the contractors to leave the works in all respects clean and perfect at the completion thereof.

4. Complete copies of the drawings and specification signed by the architect are to be furnished by him or by the measuring surveyor to the contractors for their own use, and the same or copies thereof are to be kept on the buildings in charge of a competent foreman, who is to be constantly kept on the ground by the contractors, and to whom instructions can be given by the architect. The contractors are not to sublet the works or any part thereof without the consent in writing of the architect.

5. The architect is to have at all times access to the works, which are to be entirely under his control. He may require the contractors to dismiss any person in the contractors' employ upon the works, who may be incompetent or misconduct himself, and the contractors are forthwith to comply with such requirement.

6. The contractors are not to vary or deviate from the drawings or specification, or execute any extra work of any kind whatsoever, unless the same be required to comply with any of the provisions of any of the Acts of Parliament, regulations, or by-laws hereinbefore mentioned, or unless upon the authority of the architect, to be sufficiently shown by any order in writing, or by any plan or drawing expressly given and signed or initialled by him, as an extra or variation, or by any subsequent written approval signed or initialled by him. In cases of day-work, all vouchers for the same are to be delivered to the architect or clerk of the works at latest during the week following that in which the work may have been done, and only such day-work is to be allowed for, as such, as may have been authorised by the architect to be so done, unless the work cannot from its character be properly measured and valued.

7. Any authority given by the architect for any alteration or addition in or to the works is not to vitiate the contract; but all additions, omissions, or variations made in carrying out the works for which a price may not have been previously agreed upon, are to be measured and valued, and certified for by the architect, and added to or deducted from the amount of the contract, as the case may be, according to the schedule of prices annexed, or where the same may not apply at fair measure and value.

8. All work and materials brought and left upon the ground by the contractors, or by their order, for the purpose of forming part of the works, are to be considered to be the property of the employer, when payment shall have been made of the amount of any certificate in which the value thereof shall be included, and in such case the same are not to be removed or taken away by the contractors or any other person without the special license and consent of the architect; but the employer is not to be in any way answerable for any loss or damage which may happen to or in respect of any such work or materials, either by the same being lost or stolen, or injured by weather or otherwise.

9. The architect is to have full power to require the removal from the premises of all materials which in his opinion are not in accordance with the specification, and in case of default the employer is to be at liberty to employ other persons to remove the same without being answerable or accountable for any loss or damage that may arise or happen to such materials; and the architect is also to have full power to require other proper materials to be substituted; and in case of default the employer may cause the same to be supplied, and all the costs which may attend such removal and substitution are to be borne by the contractors.

10. Should any of the works be, in the opinion of the architect, executed with improper materials or defective workmanship, the contractors are, when required by the architect during the progress of the work, forthwith to re-execute the same, and to substitute proper materials and workmanship, and, in case of default of the contractors in so doing within a reasonable time, the architect is to have full power to employ other persons to re-execute the work, and the cost thereof is to be borne by the contractors.

11. Any defects, shrinkage, and other faults which may appear within months from the completion of the building, and arising out of defective or improper materials or workmanship, are, upon the direction of the architect, to be amended and made good by the contractors at their own cost, unless the architect shall decide that they ought to be paid for the same; and, in case of default, the employer may recover from the contractors the cost of making good the works.

12. The contractors are to insure the building against loss or damage by fire, in an office to be approved, in the joint names of the employer and contractors for half the value of the works executed until it shall be covered in, and thenceforth until completion, in three-fourths of the amount of such value, and are, upon request, to produce to the architect the policies and the receipts for the premiums for such insurance. All moneys received under any such policies are to be applied in or towards the rebuilding or reparation of the works destroyed or injured. In case of neglect, the employer is to be at liberty to insure and deduct the amount of the premiums paid from any moneys payable to the contractors.

13. The building, from the commencement of the works to the completion of the same, is to be under the contractors' charge; they are to be held responsible for, and are to make good all injuries, damages, and repair, occasioned or rendered necessary to the same, by fire or by causes over which the contractors shall have control, and they are to hold the employer harmless from any claims for injuries to persons, or for structural damage to property happening from any neglect, default, want of proper care, or misconduct on the part of the contractors, or of any one in their employ, during the execution of the works.

14. The employer is at all times to have free access to the works, and is to have full power to send workmen upon the premises to execute fittings and other works not included in the contract, for whose operations the contrac-

tors are to afford every reasonable facility during ordinary working hours, provided that such operations shall be carried on in such a manner as not to impede the progress of the works included in the contract, but the contractors are not to be responsible for any damage which may happen to, or be occasioned by, any such fittings or other works.

15. The contractors are to complete the whole of the works (except painting and papering, or such other works as the architect may desire to delay), within calendar months after the commencement of the same, unless the works be delayed by reason of any inclement weather, or causes not under the contractors' control, or in case of comb'nation of workmen, or strikes, or lock-out affecting any of the building trades, for which due allowance shall be made by the architect, and then the contractors are to complete the works within such time as the architect shall consider to be reasonable, and shall from time to time in writing appoint, and in case of default, the contractors are to pay or allow to the employer as and by way of liquidated and agreed damages, the sum of *l.* per week for every week during which they shall be so in default, until the whole of the works (except as aforesaid) shall be so completed, provided the architect shall in writing certify that the works could have been reasonably completed within the time appointed.

16. If the contractors shall become bankrupt, or compound with or make any assignment for the benefit of their creditors, or shall suspend or delay the performance of their part of the contract (except on account of causes mentioned in clause 15, or on account of being restrained or hindered under any proceedings taken by parties interested in any neighbouring property, or in consequence of not having proper instructions, for which the contractors shall have duly applied), the employer, by the architect, may give to the contractors or their assignee or trustee, as the case may be, notice requiring the works to be proceeded with, and in case of default on the part of the contractors or their assignee or trustee for a period of days, it shall be lawful for the employer, by the architect, to enter upon and take possession of the works, and to employ any other person or persons to carry on and complete the same, and to authorise him or them to use the plant, materials, and property of the contractors upon the works; and the costs and charges incurred in any way in carrying on and completing the said works are to be paid to the employer by the contractors, or may be set off by the employer against any money due, or to become due, to the contractors.

17. When the value of the works executed and not included in any former certificate shall from time to time amount to the sum of *l.*, or otherwise, at the architect's reasonable discretion, the contractors are to be entitled to receive payment at the rate of 80 per cent. upon such value until the difference between the per centage and the value of the works executed shall amount to per cent. upon the amount of the contract, after which time the contractors are to be entitled to receive payment of the full value of all works executed and not included in any former payment, and the architect is to give to the contractors certificates accordingly; and when the works shall be completed, or possession of the building shall be given up to the employer, the contractors are to be entitled to receive one moiety of the amount remaining due, according to the best estimate of the same that can then be made, and the architect is to give to the contractors certificates accordingly, and the contractors are to be entitled to receive the balance of all moneys due or payable to them under or by virtue of the contract within months from the completion of the works, or from the date of giving up possession thereof to the employer, whichever shall first happen. The contractors are to be entitled to receive any sum reserved for painting and papering or otherwise, on the completion thereof. Provided always that no final or other certificate is to cover or relieve the contractors from their liability under the provisions of Clause No. 11, whether or not the same be notified by the architect at the time or subsequently to granting any such certificate.

18. A certificate of the architect, or an award of the referee hereinafter referred to, as the case may be, showing the final balance due or payable to the contractors, is to be conclusive evidence of the works having been duly completed, and that the contractors are entitled to receive payment of the final balance, but without prejudice to the liability of the contractors under the provisions of Clause No. 11.

19. If the employer shall make default in paying any moneys to which the contractors may become entitled, for days after the amount thereof shall have been certified, or if the works be delayed for months by or under any proceedings taken by any other parties, the contractors are to be at liberty to suspend the works, and to require payment for all works executed, and all materials wrought up, and for any loss which they may sustain upon any goods or materials purchased for the works, and in such case the contractors are not to be bound to proceed further with the works contracted for. The contractors are to be entitled to such interest and at such rate as the architect shall certify upon all moneys payable to the contractors, payment of which may have been unduly delayed.

20. Provided always that in case any question, dispute, or difference shall arise between the employer, or the architect on his behalf, and the contractors as to what additions, if any, ought in fairness to be made to the amount of the contract by reason of the works being delayed through no fault of the contractors, or by reason or on account of any directions or requisitions of the architect, involving increased cost to the contractors beyond the cost properly attending the carrying out the contract according to the true intent and meaning of the signed drawings and specification, or as to the works having been duly completed, or as to the construction of these presents, or as to any other matter or thing arising under or out of this contract except as to matters left during the progress of the works to the sole decision or requisition of the architect under Clauses Nos. 1, 9, and 10, or in case the contractors shall be dissatisfied with any certificate of the architect under Clause No. 7, or under the proviso in Clause No. 15, or in case he shall withhold or not give any certificate to which they may be entitled; then such question, dispute, or difference, or such certificate, or the value or matter which should be certified, as the case may be, is to be from time to time referred to the arbitration and final decision of* , architect, or in the event of his death or unwillingness to act, then of* architect, and in the event of his death or unwillingness to act, then of an architect, being a Fellow of the Royal Institute of British Architects, to be appointed on the request of either party by the president for the time being of such Institute, and the award of such referee is to be equivalent to a certificate of the architect, and the contractors are to be paid accordingly.

* The Council of the Royal Institute of British Architects require that this blank should be filled in with the name of a Fellow of the Institute.

MUSIC AT THE ALBERT HALL.

SIR,—The extremely interesting article on the Royal Albert Hall, in the *Builder* of Dec. 10th.—interesting both in regard to practical and artistic considerations,—contains one or two remarks as to the probable future success of the building as a grand music-room, to which I should like to add one or two observations, especially with reference to the large organ which is to be placed there.

It is observed in your article that the "peculiarly hard character of the cement and scagliola used" is among the elements of acoustic success. I think this perfectly true with regard to singing, and especially as to the possibility of *solo* voices being distinctly heard. Everything which promotes reverberation is usually an element of success with regard to the effect of a single voice in a large hall, as it thereby gathers an artificial power and fulness of tone which it would not otherwise appear to possess when heard in such a large area. This reverberation would not probably prove detrimental either to the effect of a full band, save perhaps in somewhat exaggerating the effect of the brass instruments as compared with the strings; the most powerful and brilliant sounds always of course drawing forth also the most distinct and marked echo. But in regard to the organ, the question is rather a serious one. In the town from which I write (Liverpool), a large organ, by the same maker who is to build, or is building, the Kensington organ, is placed in a large hall, also remarkable for the hardness of the materials of which its walls and floor are composed, and for its consequent ready and prolonged reverberation. Now, the effect of this upon the multitudinous and powerful pipes used in the full organ, is such as, in the majority of cases, to cause a hopeless confusion of sounds, to such an extent that an elaborate organ fugue becomes in many cases a mere undistinguishable Babel of sound, even to those to whom every bar of the music is familiar. Even the crowding of St. George's Hall with a large audience does but partially modify this serious drawback to the enjoyment of the very high class of organ performances given there; and it was once proposed to hang with draped curtains the recessed arches which flank each side of the room, in order, if possible, to swallow up some of this superabundant flood of sound. Judging from the description of the materials forming the interior of the Albert Hall, it appears to me but too likely that the same result will occur there to mar any organ performances which may be given.

In your remark as to the generally "brassy" and harsh sound of modern large organs (which an eminent musical critic has described as "absolutely surgical to the ear"), I fully concur. This effect in modern organs arises in great measure from the different proportions in which the two classes of pipes used in an organ are balanced in the present day, compared with what formerly prevailed. An organ commonly contains two distinct classes of pipe,—the "flue-pipes," which are the typical form of organ pipe with a mouth or "lip" in front, the aspect of which is familiar to every one; and the "reed-pipes," shaped commonly like an inverted cone, and in which the quality and the pitch of the note depend mainly on the vibration of a metal tongue placed at the mouth of the pipe, the pipe itself merely giving volume and resonance to the sound thus produced. Now, the first class, the flue-pipes, produce what we know as the characteristic organ tone, which is distinct in its nature from any other musical effect; the reed-pipes have always what may be termed a "brassy" or trumpet-like tone and *timbre*, and are, in fact, in general more or less successful imitations of brass or "reed" instruments, such as the trumpet or clarionet.

In the older school of organs the flue-work was always made the basis of the whole, and formed by far the larger portion of the instrument, the reeds (where they were not used for special purposes, as "solo stops"), merely serving to blend with and strengthen the combined effect of the full organ. In most modern organs the flue-stops are, indeed, still made the basis of the instrument, but the number and power of the reed-stops is much augmented, to such an extent that in many large organs the reed tone, when the full organ is used, quite overpowers the flue tone, and the instrument becomes more like a gigantic harmonium than like what used to be formerly recognised as an organ; the reeds being often placed on a heavier wind than the other stops. The style of playing and "registering" (*i. e.* combining the stops) is also changed, and from some of our cleverest and most able organists we rarely get the pure tone of the flue-pipes at all, but hear scarcely anything but reeds. One cause of this change in the method of playing is the modern ambition on the part of organists to make their instruments imitate the orchestra, and to play on it marches, overtures, and arrangements from symphonies, &c., which are foreign to the real genius of the instrument; and instead of genuine organ music, which is a branch of musical art standing by itself, and distinct from anything else, we get only what is, after all, but a poor imitation of what an orchestra would do much better. It is for this imitation, however, and for the achievement of a hard metallic brilliancy of effect that the modern predominance of reed-stops is required; and I fear that no one has done more to supply and, at the same time, foster the demand for this style of instrument, than the talented organ-builder who is understood to be entrusted with the building of the new Kensington organ. This is perhaps a very natural weakness, inasmuch as Mr. Willis has produced reed-stops probably superior in power, equality, and brilliancy to those of any other maker, ancient or modern, for which let him have all the credit due to him; but there may be too much of a good thing, and if those who have the direction of matters in connexion with the Albert Hall would endeavour to influence their organ-builder (if it is not now too late) to give them something more like an "organ," pure and simple, and less like an imitation of a combined brass and reed band than some that he and others have erected, the result would probably be more satisfactory, both æsthetically and practically. For this question also bears upon the result with regard to echo in a large building; as, in a band, it is the trumpets and trombones which chiefly draw for an echo in the building, so in an organ it is mainly the powerful reed-stops that contribute to the confused and confusing echo which destroys the effect of full organ pieces of any elaboration; and an organ more assimilated to the old school of instrument, with more of flue-pipes and less of reeds than is now getting common, would probably be better heard, and "define" more clearly, in such a room as the Albert Hall, than an erection filled with gigantic overblown "trumpets," "tubas," and "trombas," more calculated to frighten than to please an audience.

H. H. S.

FURTHER REPORT UPON GRANITES.

HAVING on the 26th of June, 1862, reported "upon the various kinds of granite suitable for paving and road-making," and an article thereon appearing in the *Builder* of 12th November, 1870 (p. 902), and a letter by Mr. G. Hodson, with tables of crushing stress, specific gravity, &c., in the *Builder* of 10th December, 1870 (p. 989), I beg further to report:—

That there are self-evident typographical errors in the last two columns of the table showing the "crushing stress," the first of which gives the force in tons instead of pounds, and the second in tons and decimals of a ton, instead of thousands of tons.

That I most fully endorse Mr. Hodson's assertion, both as regards paving and macadamising, viz. "that the safest test to apply is that of durability;" and that the only sure way to apply this test, "is by practical experiments with the respective kinds of material, laid down at the same time, upon a continuous length of roadway."

That the following allegation cannot be accepted, viz., "that the specific gravity of any stone or rock is a general measure of its hardness or resistance to crushing stress;" but, on the contrary, the *hardness* of a stone has very little to do with its specific gravity, and certainly its *hardness* has nothing to do with its power to resist crushing stress: thus quartz, flint, and some trap-rocks, are the hardest, and yet in many cases the weakest of road materials.

That for nineteen years as town surveyor of Cambridge, I had opportunities of proving repeatedly, that the specific gravity of a rock, *per se*, is no measure of its resistance to crushing

stress; for whereas the Mountsorrel and Markfield granites are both excellent macadamising stones, yet the Bardon Hill, which has a higher specific gravity than Mountsorrel, and nearly the same as Markfield, is very inferior to both.

That in a printed table circulated by the Charnwood Granite Company, showing the resistance to crushing stress of various granites, as certified by Mr. Kirkaldy, it is shown that Guernsey granite crushed at a pressure of 15,062 lb. per square inch, which is far below that of the other granites. If, therefore, the crushing stress is any guide to the quality of the material, then Guernsey granite is weaker than any of the Leicestershire granites, while its specific gravity is 2·841, or a very little heavier than Markfield syenite, which, according to Mr. Kirkaldy, is capable of sustaining about one-third more pressure. This theoretical result is useless to any practical man who has metalled roads and paved streets with Guernsey and Leicestershire granites, and finally disposes of the specific gravity theory as applied to road materials.

That I find from practical experience that the quality which gives strength and durability to road metal is *toughness*, not *hardness*, and that the former quality may be found in rocks with either high or low specific gravities.

That in my Report to the Improvement Commissioners of Cambridge, above quoted, I showed that the intrinsic value of Guernsey granite is much greater than any of the Leicestershire granites, but that the cost of carriage effectually prevents its adoption for places any considerable distance north of London.

That I do not question the honesty and accuracy of Mr. Kirkaldy's tests. Doubtless they are correct as far as they go, but the fallacy lies in presuming that a steady pressure by machinery on a perfectly plane surface will give a result which shall be an index of the probable behaviour of the same material when subjected to the ever varying conditions of two years' exposure to frost, sun, and water, under the wear and tear of the traffic on a town street or turnpike-road.

R. REYNOLDS ROWE, M. Inst. C.E.

BUILDING GRANTS FOR SCHOOLS OF ART.

THE following information will be interesting to those who are looking forward to the probability of a grant. The regulations are in accordance with the Minutes of the Science and Art Department, revised to May, 1859, and are published by order of the Committee of Council:—

Preliminary.—1. The Lords of the Committee of Council on Education, believing that the provision of a suitable building is essential for giving permanence to local efforts in establishing a School of Art, and that no part of the fees received for instruction should be absorbed in payment of rent, are prepared, subject to the conditions hereinafter set forth, to aid in:—(*a.*) Erecting suitable buildings for Schools of Art. (*b.*) Erecting suitable rooms as parts of, or additions to, buildings to be used for other purposes. (*c.*) Purchasing suitable building already erected. 2. All applications for building grants towards the erection of Schools of Art must be addressed to the Secretary of the Science and Art Department, South Kensington, London, W. 3. All applications for grants out of the Parliamentary Vote for any year must be sent in on or before the 15th of November in the year preceding. 4. No grant will exceed 2s. 6d. per square foot of internal area, and no grant will exceed 500*l*. 5. No grant will be made unless their lordships are satisfied:—(*a.*) That there is a population in the neighbourhood which requires a School of Art. (*b.*) That the School of Art is likely to be maintained in efficiency. 6. The site, plans, estimates, specifications, title, and trust deed, must be satisfactory to the Committee of Council.

The Site.—7. A plan of the site must be forwarded, drawn to a scale of 1-8th of an inch to a foot, and showing the boundaries, approaches, and abuttals. 8. The site must be:—(*a.*) In situation, not unhealthy, nor noisy. (*b.*) Within convenient distance of the home of the students. (*c.*) In tenure, fee-simple, without incumbrance or rights reserved over the surface, or reservation of minerals.

The Plans.—1. The following dimensions are suggested as affording adequate provision for accommodating fifty students. Proportionately increased accommodation must be provided for greater numbers. (*a.*) One elementary room, 20 ft. by 80 ft. This room should be east and west, it should be not less than 16 ft. high, and should be lighted from above. (*b.*) One painting-room, 20 ft. by 15 ft. This room should be lighted from the north side, and should have a top light in the roof *over* and in continuation of the side light. (*c.*) One modelling-room, 20 ft. by 15 ft. (*d.*) One master's room, 12 ft. by 15 ft. This room should also be lighted by a side light, from the north if possible. (*e.*) One cloak-room for females, 12 ft. by 18 ft. 6 in. (*f.*) A kitchen and bed-room for the attendant, each 12 ft. by 10 ft. (*g.*) The rooms for study, except that which is specified in section *a*, should be not less than 15 ft. high to the wall plate, if ceiled flat, or 12 ft. high to the wall plate if ceiled to the collar-beams or to the common rafter. (*h.*) The windows should be large, free from mullions or small panes. (*i.*) The class-rooms should, as far as possible, communicate with each other directly as well as by passages. Where there are more stories than one, the staircase should give access to all rooms without passing through rooms; also to cloak-rooms, lavatory, &c. The arrangements for lighting with gas, for warming, drainage, &c., should be complete. The rooms should be well ventilated by the admission of air at the floor level, with an ample outlet above. (*k.*) Water-closets, urinals, and a lavatory must be provided; the accommodation for female students must be separate. (*l.*) The external walls of the school, if of brick, should not be less than one brick and a half in thickness; and, if of stone, not less than 20 in. in thickness. All the roofs must be either tiled or slated. Gutters and drains to carry away the roof-water must be provided. (*m.*) If the roof be unceiled to the tie-beam or collar-beam, there must be ceiling to the rafters. Rooms which are top-lighted should in all cases be ceiled to the common rafters, in order to give increased height; and all tie-beams or other heavy roof timbering should be avoided, and iron tie-rods used where practicable. 10. In the case of the purchase of buildings already erected, they must be certified by an officer of the Department to be suitable in all respects for the purposes of a School of Art. 11. The plans (with specification and estimate) when approved and sealed, may be returned to the promoters for use, but must be lodged in the Science and Art Department before a grant is paid.

There are other clauses with reference to trust deeds and payment of grants, &c.

CAUDEBEC LADY CHAPEL.

SIR,—Mr. Papworth does not explain the seeming impossibility of which I spoke; he only transfers the responsibility of it to some one else's shoulders.

That Mr. Pugin actually measured the voussoirs of this vault I cannot understand, seeing that he must have had it taken down to do so. That he is approximately correct in his drawings there is not much doubt, the geometrical principles on which the vault is designed being so very evident.

One has only to look at the section shown on page 1012 of Mr. Papworth's edition of Mr. Gwilt's Encyclopædia to become aware of all the difficulties attending such a piece of measurement.

JOH. B. CORBY.

DEFECTIVE DRAINAGE OF WESTMINSTER.

SIR,—The Royal city is far behind the commercial centre of our great metropolis in respect of its sewerage. Passing the other evening from Charing Cross towards Westminster Bridge, I met with three huge oceans of muddy water between Scotland-yard and Richmond-terrace, which had formed along the kennel on the left-hand side of the road to the depth of 4 in. or 6 in.; and through which the *crawlers*, unhired cabs, seemed to take delight in splashing their way, thereby inundating the footpath, and sprinkling the pedestrians.

It appears that this unpleasant effect is always produced when a heavy rain falls about the time of high tide; and the anomaly is, that the evil has much increased, so it is said, since the construction of the main-drainage works along the Victoria Embankment.

It is truly marvellous to find such a gross nuisance permitted in this leading thoroughfare; in close proximity to our chief Government offices, and adjoining the private residences of some of the chief magnates of our land.

A. H. GENT.

THE NEW WORKHOUSE AT ST. ERMIN'S HILL, FOR WESTMINSTER.

AT the usual meeting of the St. George's, Hanover-square, Union Board of Guardians, on Wednesday, Mr. H. H. Seymour, in the chair, a report was read from a special committee respecting the purchase of land at St. Ermin's-hill, for a new workhouse. The report recommended that negotiations for the purchase be re-opened, and that a piece of land in Snow's Rents be secured. Colonel Haygarth moved the adoption of the report, and said it was a question of 250*l*. The committee, who had offered 1,750*l*. for the land, were now asked 2,000*l*. for it. Mr. Doughty seconded the motion, observing that it was very desirable to secure the piece of land. Mr. Scudamore objected to the building of another workhouse, and moved as an amendment that no further steps be taken at present; Mr. Fleming seconded. Mr. Mitchell also objected to the new house, and remarked that the expenses of the Union were increasing year by year. The Chairman observed that the old Board of Guardians had bought the land at St. Ermin's-hill to build the new house, and it would be very desirable to have this piece of land in Snow's Rents. Mr. Doughty added that, under the orders of the Poor Law Board, the Guardians were bound to build the house. After this Mr. Scudamore withdrew his amendment, and the report was adopted.

THE TRAFALGAR GRAVING DOCK.

SIR,—Touching Mr. Redman's remarks respecting the Trafalgar Graving Dock at Woolwich, I regret very much having stated that the idea of a dock was abandoned, seeing that a noble one has been constructed on the spot referred to.

Mr. Walker was called in by the Admiralty in 1835 at my recommendation, on the failure of Mr. Ranger's concrete dock, which was caused by his consenting to lower the floor of the dock (after it was constructed) 4 ft., whereby the springs prevailed.

Mr. Walker observed, "Nothing but a granite dock will do," and made designs for the same, which I understood were carried out so far as specifications and preparation for a contract. I was then informed, on what I considered reliable authority, that the idea of a dock was abandoned. I have not seen the spot since.

I have no doubt that Mr. Walker, or rather the Board, hesitated to encounter the expense of a granite dock.

But in 1838 it appears, as so well described by Mr. Redman, that Mr. Walker again visited the yard with Sir Charles Adam and Mr. Laing; the dock was resolved upon, for which he prepared the contract drawings and estimates. The contract being taken by Grissell & Peto, amounting to "some 80,000*l*."

While I again express my regret at my inaccurate statement, I am glad to have given Mr. Redman the opportunity of describing how a first-rate granite dock should be, and was, constructed from his drawings, estimates, &c.

I may also express the great regret generally felt that this fine dockyard, with its noble and useful buildings and long river frontage, should be abandoned, as the public papers announce it is, seeing that in all probability it may or will be again required.

"THE OCTOGENARIAN."

ARCHITECTURAL INSTRUCTION AT THE ROYAL ACADEMY.

IN a letter which I addressed to you three weeks ago I promised to send the particulars of the proposed course of instruction in the architectural classes of the Royal Academy, when determined upon by the council of that body. I am now authorised to state them in general terms, premising at the same time that as the establishment of this school (the first of its kind in this country) will be necessarily attended by certain difficulties with which experience alone can make us acquainted, modifications may be introduced where found requisite.

The instructions I forwarded to you referred only to the preliminary drawings to be sent in by each applicant. These, with the certificate mentioned, will be submitted to the council; if deemed satisfactory, their authors will be admitted as probationers to study in these architectural classes and to attend the lectures on anatomy, painting, sculpture, and architecture. The lectures on perspective will be attended by probationers only when there is sufficient room for them and the students as well.

When admitted to the architectural classes, the probationers will be expected to execute one drawing shaded in Indian ink, one drawing from the cast, and one complete architectural design within the six months, and towards the end of this term to attend at the Academy on two days (to be fixed beforehand). On the first day they will have to execute a design of a subject which will be given at the time, and be of such a nature as to be easily worked out in six hours: on the second day, a portion of this design will be drawn to a larger scale, and a time-sketch, made in three hours, of some piece of ornament from the round. All these drawings will be submitted to the council, and if deemed satisfactory the probationer will be admitted as a student of the Royal Academy for seven years. In the event of a probationer not succeeding the first time, he will be allowed to continue his studies as before. The classes will be held on Tuesday, Wednesday, and Friday evenings, from 6 p.m. to 8 p.m.

COURSE OF INSTRUCTION.

Probationers.

1. Architectural Drawing.—The delineation of some of the best specimens of antiquity, either Classic or Gothic; first in line drawing, and then shaded in Indian ink in graduated and flat tones.

(This is the universal method adopted in France and Germany, to acquire care and accuracy in drawing, and power and facility in the use of the brush. Its main object, however, is to enable the student to recognise in a geometrical drawing the relative value of the various projections either of the wings, or manes of the building, or of cornices, string-courses, or other decorative features, without being obliged to have recourse to a perspective drawing.)

2. Drawing from the Ornamental Cast.

3. Architectural Design.—A subject will be given out two months or six weeks, and worked out at home; the drawings will be submitted once a week to the master; taken home, and altered after his criticism. At the end of the two months or six weeks, finished drawings, not too elaborate, will be brought back, and sent in as probationers' work.

Students.

1. Architectural Drawing.—Similar to probationers' work, except that the shading will not be from copies as before, and the geometrical projections of shadows will be taught.

2. Drawing from the Ornamental Cast.—(Same as before, except that, as architects' drawings are only the means of communicating certain forms to the sculptor or carver, they should not be too elaborately finished, but, though carefully drawn, rapid and effective.)

3. Architectural Design as above, but of a higher class.—(Here, as with probationers' work, text-books will be pointed out to the student, in which he may find the best examples of the particular style of his design. Some of these books will be kept in the architectural room for reference; as, for instance,—Stuart and Revett's Athens, Blouett's "Baths of Caracalla," Brandon's "Analysis of Gothic Architecture," Viollet le Duc's "Dictionnaire Raisonné," Letarouilly's Rome, and Sauvageot's or Berty's Renaissance of Francis I., &c.)

As experience may dictate, the following courses will be introduced:—

4. A course of study, consisting of the delineation and projection of vaulting and groining from the early barrel vaults of the Romans, tracing its development through the Middle Ages down to the sixteenth century.

5. An occasional course, in which designs will have to be worked out in accordance within certain perfected styles.

6. An occasional course, involving the restoration of portions of certain well-known examples of antiquity.

(These two courses, archæological in their tendency, are adopted in France by the professors of the schools there, their object being to instil into the student's mind

an academical knowledge of precedent as the best foundation for the acquirement of a knowledge of architectural design.)

7. A course of composition in ornamental design.

The medals will be awarded as before. These are as follow:—

A gold medal and a scholarship of 25*l.* tenable for two years, for the best architectural design worked out at home.

A travelling studentship of the value of 100*l.* for one year, for the best architectural design executed in one month in the Architectural Class-room of the Royal Academy.

A silver medal for the best series of measured drawings of some building; and in alternate years, in addition, a silver medal, with books.

And a silver medal for a perspective drawing and a specimen of sciography.

It is to be hoped in future that the competitors will be more numerous. There was only one competitor for the silver medal for measured drawings this year, and none for the perspective medal; while the books of the Academy show that, during the last seven years, from 25 to 28 per cent. only of the students have ever competed. Now, however, that the Academy have placed the architectural students on the same footing as the painter or sculptor, there is no reason why the number of competitors in both classes should not be equalised.

R. Phené Spiers,
Master of the Architectural School of the Royal Academy.

SCHOOL FOR FIFTY CHILDREN AND RESIDENCE FOR TEACHER, FOR 160*l.*

Sir,—There has been built in my parish of Wysall' Nottingham, for the sum of 160*l.*, a school for fifty children, with residence attached, and offices. The dimensions are as follows:—

School.—Length, 25 ft. 3 in.; width, 16 ft. inside; walls, 11 ft. high; roof open, 17 ft. high. The school contains four windows, 5 ft. high by 4 ft. wide. There are also porch and chimney. The floor is boarded.

The House.—Two lower rooms: Front, 12 ft. 6 in. by 11 ft.; kitchen, 12 ft. 6 in. by 6 ft. 1 in; height, 8 ft. Bedrooms: Front, 13 ft. by 11 ft., with recess in addition. Back, 9 ft. by 8 ft.; height, 8 ft. 6 in. All the outer walls are 14 in. thick. There is ample room for pantry under staircase. There are separate offices, with dust-bin between, not yet finished.

The whole material and workmanship, and proper painting for the above, have been found, and done for 160*l.* The parishioners do carting without charge. I am architect and clerk of works. Mr. William Bryans, of Wysall, is builder. It is so important to assist parishes to build voluntary schools, that for twenty-four stamps I will send two photographs of building, with printed specifications and instructions.

John Parker, Vicar of Willoughby and Wysall.

"MEMBERS OF THE INSTITUTE AND THE PROFESSION."

Sir,—In reply to "E.'s" inquiry, whether "taking payment from builders" is an infringement of the rules of the Institute, I beg to refer him to the sheet of "professional practice and charges of architects," published by the Royal Institute of British Architects. The concluding paragraph is in these words,—"It is not desirable that an architect should supply to builders quantities, on which to form tenders for executing his design; but, in case of such being done, it should be with the concurrence of the employer, and the architect should be paid by him and not by the builder."

Thos. L. Donaldson.

Sir,—A question was put to me a short time ago, which I was unable to answer; I therefore venture to ask for the required information. Is it usual to insert the following clause in specifications:—"The builder to pay to the architect the sum of (in the present instance) six guineas for the preparation of contract, and for copies of drawings and specification to attach to same, to be paid by builder at the time of execution of contract?" I think it is a pity that the name of the enterprising traveller by railway into Pembrokeshire every fortnight should be withheld from the public.

X. Y. Z.

DOMESTIC CHAPEL, SANDBECK PARK.

A new domestic chapel has been built at the north end of the mansion at Sandbeck Park, the seat of the Earl of Scarborough.

The body of the chapel is 22 ft. wide by 51 ft. long, the chancel and apse being 21 ft. 6 in. long by 15 ft. wide. The structure is from the designs of Mr. Ferrey, F.S.A., architect, and is of the Early English style, and built of the beautiful stone from the Roche Abbey quarries. There is a north porch and doorway for the tenants and others, and on the south side an entrance for the family, visitors, and domestics. The nave is divided into four bays, lighted by handsome couplet windows on the north side, filled with glazing, and arranged in geometrical patterns. The roof is of massive pitch-pine timber, ornamented with pierced spandrels, &c.; the principal trusses and purlins being carried upon bold stone arches, with deeply-sunk mouldings, each arch supported by attached triple wall-shafts, the capitals and corbels carved. In the western gable there is a circular window, with radiating mullions, filled with painted glass, by Hudson, of London. Beneath is a small oblong window, in which is preserved some glass from the old domestic chapel, painted by a former Lady Scarborough.

The west end is peculiar in its arrangement, there being a small stone gallery carried upon projecting corbels in connexion with a stone arcade, and treated as a constructional part of the building. The owner enters this gallery from a door on the south side, communicating with the private apartments.

The chancel-roof is wagon-headed, and ornamented with carved ribs, springing from small columns at each angle of the chancel and apse, the whole coloured, studded with stars on a blue ground, and the larger spaces filled with the Evangelists' emblems. At the springing of the ceiling is the following inscription:—"Erected to the Glory of God, and in memory of a beloved Son."

The five lancet windows contain painted glass by Ward & Hughes, of London. Under there is an ornamental wall arcade, having shafts of Derbyshire marble. The chancel arch is lofty, carried on marble columns, which are supported by corbels elaborately carved. The floor of the chancel is laid with encaustic tiles, enclosed in geometrical devices of Derbyshire marble; the chancel steps are of black marble.

The stone pulpit stands at the north corner of the nave, which is fitted up with open benches of pitch pine, the gangway being laid with encaustic red and black tiles.

The chapel makes a handsome feature at the north end of the garden terrace, the apse and small bell-turret on the east gable of the nave forming an agreeable group. The roofs are covered with green Coniston slates, and the general facing of the walls is of rough stone laid in random courses, which contrasts with the dressings of Roche Abbey stone.

HEAT AND DAMP.

Sir,—1. What is the best method, other than the use of felt, of obviating the effect of sun's heat on the roofs of houses when building?

2. Is a bed of concrete under the floor effectual in keeping down damp likely to rise when building on a clay soil, or is there a better plan?

D.

*** An air-space between the outer covering and inner lining of roof is the best moderator. Whitewash on the slates or tiles (in the case of farm buildings, &c.) serves to lessen the effect of sun's heat.

A bed of good concrete under floor will keep down damp: a layer of asphalte on a thin bed of concrete does so more effectually still.

THE LATE MR. PATRICK M'DOWELL, R.A., SCULPTOR.

Mr. Patrick McDowell, R.A., the eminent sculptor, has just died, aged 71. He was elected Royal Academician in 1846, and had just resigned his fellowship before he died. He was a native of Belfast, where he was born on the 12th of August, 1799. His father having met with some reverses of fortune, he at the age of eight was sent to a small school in Belfast, where the first tokens of his genius displayed themselves in the direction of art by the copying of such models as chance threw in his way. At twelve he came to England with his mother, who apprenticed him to a coachbuilder in Hampshire; but the bankruptcy of his master set him free, and, fortune having made him acquainted with a French sculptor, he found an opportunity of improving his talent. He could hardly have been of age when we find him engaging a studio near Euston-square, and setting up as a sculptor on his own account. After some previous attempts, which were only partially successful, he made his first essay on an ideal subject, which he took from Moore's "Loves of the Angels." The first commission with which he was entrusted for a group in marble was from Mr. E. S. Cooper, formerly M.P. for Sligo. The subject was Cephalus and Procris; and the conception and style of execution were such as to fix at once Mr. M'Dowell's position in the world of art. The work which fully established his fame, however, was his charming figure of "A Girl Reading," which was afterwards repeated for the late Lord Ellesmere. He had scarcely completed his first large group for Mr. Beaumont, when that gentleman, desirous that the sculptor should visit Italy, supplied him with the necessary funds. After an absence of eight months, he returned to England and completed his "Love Triumphant." To this succeeded "A Girl at Prayer," "Cupid," "Early Sorrow," "Psyche," "The Death of Virginia," and "Eva," all of which formed leading attractions in the International Exhibition of 1851. In 1846, Mr. M'Dowell was entrusted by the late Sir Robert Peel with the execution of one of the national statues of British Admirals (Lord Exmouth) for the decoration of Greenwich Hospital. He also executed those of Pitt and Chatham for the House of Lords.

THE TRANSVERSE STRENGTH OF STONE.

Sir,—"A Mason," or any other person who has the information, would greatly oblige myself, and no doubt many of your readers, if he could give some formulæ for calculating the *transverse* strength of stone slabs and beams of, say, the various descriptions of Yorkshire stones and the oolites most commonly used in London building. In all the tables to which I have access I can find nothing else than the *crushing* strength of stone columns.

H. A. C.

CITY OF LONDON UNION NEW OFFICES COMPETITION.

Three designs have been selected from those sent in. A writer in the *City Press* says:—

"One of these designs shows a board-room no more than 40 ft. by 30 ft., and this for the accommodation of ninety-three guardians, the public, and the press.

A second design shows the Assessment Committee-room, where appeals will be held, no more than 17 ft. by 16 ft., while there is no separate waiting-room and clerk's office, as required by the conditions to be attached to this committee-room, unless a little box partitioned off the general office can be called a clerk's office.

The remaining design has a board-room on the second floor (the real first floor being dubbed a mezzanine). There is no waiting-room for the public, who will have to stand on the landing outside the board-room door. The committee-room is 15 ft. by 12 ft. 6 in. The access for guardians to the relief committee-rooms is by going out of doors, across a dark public passage, and through one of the rooms into the other."

Ancient lights will stand greatly in the way of the realisation of some of the designs.

THE PROFIT AND LOSS ACCOUNT OF THE PUBLIC HEALTH.

We have often pointed attention to the actual money loss to the community incurred by defective or bad sanitary arrangements. The following remarks by the *Times* on this subject, while drawing attention to Mr. Simon's report to the Privy Council, merit quotation.

Sanitary reformers are now impeded in their work chiefly by ignorance; and to obtain and diffuse knowledge of the conditions of spreading of local epidemics would certainly remove many of the local difficulties in the way of reform. In a few years it will be possible to show that the prevalence and fatality of every disease bear a distinct relation to the presence of local conditions; that a row of cottages draining into their own wells causes an annual expenditure in poor-rates nearly equal to the absolute value of the property in fee-simple, and that it would pay the parish to buy them and pull them down, if the erections of others with like defects could be prevented. It is only by pressing home facts of this class in the districts where they occur that the waste of lives and money incidental to our present laxity will be made apparent to any general body of ratepayers; and there can be no doubt that a proper appreciation of this waste will be the first step towards much-needed reform. A county or union sanitary Board, charged with investigating the facts about the presence and the effects of nuisance within its jurisdiction, would certainly in no long time bring the public mind to a practical sense of the enormity of those evils which sanitarians with one consent deplore, but which uninstructed people are too apt to consider either mythical or unnecessary. The average middle-class inhabitant of a

provincial town cannot now be made to believe that several hundreds of his neighbours die unnecessarily every year,—as much murdered by the absence of the care necessary to preserve human life in communities as if they were hanged in the market-place as sacrifices to the genius of incompetence. But when it is made apparent that typhoid fever, or scarlet fever, breaks out in several successive years in the same tramps' lodging-house; going always to the same row of cottages; that it follows the onward course of the brook into which these cottages drain; that on reaching the house of the laundress it starts afresh to visit the whole circle of her customers; that it produces every year an aggregate of so much mortality and of so many cases and days of sickness; that it leaves so many widows and orphans, so many lame and blind, to be maintained at the public cost; and that this sequence of events is invariable,—the result not of accident, but of law; surely the most typical *épicier* will in time arrive at the conclusion that the lodging-house, and the related cottages, and the polluted brook, are costly and hurtful luxuries, and that money will be well laid out in modifying or abolishing them. In this way, and probably in this way only, will it be possible in no long time to obtain a sanitary law that will at once be an adequate expression of scientific knowledge and a natural growth of public opinion. All that can as yet be done is to provide a machinery by which the required knowledge can be collected and diffused, and by which any powers that may hereafter be conferred may be efficiently and discreetly exercised.

A "LIGHT AND AIR" CASE IN CHANCERY.

The case of Ladyman *v.* Grave, in which the plaintiff sought an injunction against the defendant for having built some back walls of cottages so as to obstruct "ancient lights," has been heard before Vice-Chancellor Stuart, in Lincoln's-inn. The plaintiff is Mr. Samuel Ladyman, of Portinscale, Crosthwaite, Cumberland; and the defendant is Mr. John Grave, the Mayor of Manchester. It appeared that the defendant built certain cottages, the walls of which were raised to such a height as to obstruct the plaintiff's light. The question before the Court was whether the plaintiff had the "ancient lights" that he sought to protect. Voluminous evidence was gone into, and the Vice-Chancellor, in giving judgment, said the case was attended with very great difficulty, both in law and fact. Upon the evidence, it seemed to him that the weight of evidence was in favour of the plaintiff, and that the defendant had not proved that there was a unity of possession within twenty years after the house was completed before the filing of the bill. Cases had been quoted to prove that it was necessary for plaintiff to prove enjoyment of access of light for twenty years next before that on which the bill was filed. His Honour was of opinion that that applied only to cases within the statute of William IV., and not to cases of lights that had become "ancient lights" by an enjoyment for the prescribed period anterior to the passing of the statute. If that were so, then the plaintiff had established his case. His Honour was satisfied that it had not been proved that there was a disturbance of plaintiff's possession; and therefore the plaintiff was entitled to the injunction prayed for, and he must have the costs of the suit. Judgment accordingly.

MELTON MOWBRAY.

The new Cattle Market here has been opened, and is now used by the public. The pens for beasts and sheep are constructed of wrought and cast iron entirely, and are very substantial. The beast-pens are paved with Mountsorrel squared granite, the sheep-pens with asphalte, and the avenues are of the same material. The general roads and avenues of beast-pens are macadamised and covered with gravel. On the east side of the market, contiguous to the sheep-pens, is a large covered shed, fitted up with wrought-iron pens for pigs, and a similar shed is placed on the west side, contiguous to the beast-pens, for calves. In the centre of the market is a conveniently-arranged settling-room and office for clerk of the market, at the back of which are closets and urinals; and still further back is the public slaughter-house, which has fasting-pens and the usual appliances, and the walls of which internally are lined with white-glazed bricks, giving it a cleanly appearance, and offering every facility for rapid cleaning after it has been used. Over these buildings is a large wrought-iron tank, from which the water is laid on to various points to supply the market. The market is divided from the adjoining paddocks by a wrought-iron fence, with gates, at intervals, to admit of the paddocks being used at fairs in connexion with the market. There are two entrances, at each side of the market, both opening into important public thoroughfares, and these have massive stone piers, and very strong ornamental wrought-iron gates. MacFarlane's urinals are placed in different parts of the market. There is also a convenient loading-stage for sheep and pigs. The drainage, which is of an elaborate character, comprises nearly a mile of glazed piping, and is carried into the main sewer belonging to the town. A large refreshment-room is now in course of erection in the market.

The contract for the general works was taken by Messrs. Weaver & Son, of Melton; and that for the ironwork by Messrs. Richards & Co., of Leicester; and the work has been well and substantially carried out from the plans and under the superintendence of Mr. R. W. Johnson, architect, of Melton Mowbray, the total outlay being about 5,000*l.*

The new Wesleyan Chapel and Schools have been commenced, the first stone having been laid by Mr. J. S. Budgett, of London, with the usual ceremony. The new building comprises a lofty school-room and class-rooms under the chapel. The chapel itself, which is raised some 6 ft. above the ground, to enable the basement to be well lighted, has side aisles and two transepts at the east end, and galleries round three sides. The organ-chamber is at the back of the pulpit. The principal entrance is from the west front, which has two towers at angles, containing the staircases to galleries and schoolrooms. The building, which is Gothic in character, will be of red bricks, with stone dressings, and will have a high-pitched open roof. Messrs. Winkles & Kellett, of Leicester, are the contractors, the amount of their tender being 2,400*l.*, subject to a deduction for old materials, under the direction of Mr. Johnson.

THE SAXON CHURCH, WHITTINGHAM.

The upper stages of the Saxon tower of the church at Whittingham, in Northumberland, illustrated by Rickman, were destroyed in a restoration of the church, which took place in 1840. The works undertaken at that period at this interesting church did not comprise the chancel, which was erected in the most debased style *temp.* Queen Anne. Lord Ravensworth, whose seat, Eslington Park, is in the parish, has resolved to restore the chancel in a manner commensurate with the extent and dignity of the rest of the fabric. Approved designs have been made by Mr. F. R. Wilson, architect, Alnwick, and the works are to be forthwith carried out.

CRYSTAL PALACE COMPANY.

The thirty-first ordinary general meeting has been held; Mr. T. Hughes, M.P., in the chair.

The Chairman, in submitting the usual confirmatory motion, referred, in terms of regret, to the loss the company had sustained by the death of the late manager, Mr. Bowley. Rockhills, the late manager's residence, it was hoped, would be taken by the refreshment contractors at a rental. It was to be regretted that the receipts of the past year had been about 5,000*l.* less than in the previous year, viz., 138,000*l.* as against 143,000*l.*, owing to a falling off in the number of visitors, and a decrease of 980*l.* in the receipts from rental, while the expenditure had increased 400*l.* in rates and taxes and for water; but, on the other hand, 3,700*l.* had been saved in the cost of attractions. The expenditure in permanent repairs remained heavy, and would do so for some time to come. The general result of the year's working was that on an expenditure of 97,000*l.* the net earnings had been 43,000*l.* As to the future, they must expect that the Music-hall at Kensington and the Alexandra Palace would compete with them; but there was no reason, having regard to the new attractions,—the aquarium amongst others,—and the new railway facilities from the east and other parts of London and the suburbs, to doubt that the progress of the company would be satisfactory. The surplus land at the lower part of the grounds had been advantageously let, and would ultimately bring in a ground rental of 1,300*l.* Some doubts were expressed by shareholders as to whether the special attractions were profitable, considering the great cost of producing them. Mr. Dean saw in decreasing revenue and increasing expenditure cause not only for discouragement, but alarm. A long and desultory discussion took place, ending in the adoption of the report, and a dividend of 1 per cent. was declared.

DISCOLORATION OF PAINTED COMPO FRONTS.

Sir,—About a fortnight ago, the lower front of my house, which is compo, painted, became in a few hours covered with unsightly blotches and streaks, just as if some dirty fluid had been thrown at it. The whole front had been painted in the last spring: so I called on my painter to explain so extraordinary an effect. He attributed it to effluvium from drains.

This opinion has so much alarmed me that I shall be much obliged by any of your professional readers giving their opinion as to the cause of the appearance I have described, and still more so if they will suggest a remedy.

My house is situate close to Portman-square, where I observe several compo-painted fronts presenting similar unsightly indications.

Inquirer.

*** The occurrence at certain periods of these blotches on painted cement was discussed at some length in our pages a few years ago.

ITEMS OF VALUATION.

A employs B to do some work of alteration, fitting up, &c.: no agreement or contract. Work done, B sends the account, without any items or particulars, but claiming a lump sum for the job.

A demurs, and asks for items; B refuses. The work is eventually referred to valuers.

A's valuer reduces the sum claimed by 20*l.*; B's valuer reduces it likewise, but only 5*l.* B's valuer, at the same time, refuses to compare valuations with A's, and as such they do not agree.

A third valuer is called, and he confirms B's valuation save a few shillings, but, at the same time, does not give items or show how he has arrived at the sum.

What I want to know is:—1st. Is B's valuer justified by law (not custom) in refusing to compare valuations? 2nd. Is the third valuer also justified by law in withholding the particulars of his valuation from A? For be it understood, up to this time, save only from his own valuer, A is called upon to pay a large sum of money for work done, but has had no items of their particular cost. The work consists of bay-window, door, frontispiece, wardrobe, counters, shelves, &c.

*** Under the apparent circumstances of the reference, a bill of the items could not be insisted on.

DATE OF THE SANCHI TOPE.

Sir,—The following is the statement issued by the Science and Art Department, from which it appears there is no great difference of opinion between Mr. Fergusson and the Department on the subject. General Cunningham, now Archæological Surveyor-General in India, fixes the date of the Tope at B.C. 500, which the Department adopted. Mr. Fergusson says B.C. 250; and this is supposed to be the date of the stone railing round the Tope.

"The Tope is situated on the top of a sandstone hill above 300 ft. above Sanchi. It consists of a solid dome of stone and brick, 121 ft. in diameter and 62 ft. in height. This is surrounded by a stone railing at a distance of 9 ft. 6 in., and four stone gateways were added to it. The dome dates from about 500 B.C. The stone railing is probably 250 years later, and the gateways were erected about the commencement of the Christian era. The votaries of Buddhism far outnumber those of other creeds, excepting the Christian; and this ancient monument is one of the earliest records of the growth of a religion which now owns not a single follower in the cradle of its birth, India, but can count in other countries 222 million adherents.

This cast was made in the winter of 1869 70, under the direction of Lieut. H. H. Cole, R.E., Superintendent of the Archæological Survey of India, North-Western Provinces, by Sergeant Bullen, R.E.; Corporal Jackson, R.E.; Corporal

Heath, R.E.; and nine native modellers. The party left Calcutta 10th of December, 1869, and Jubbulpore on the 13th, where the materials, tools, plaster of Paris, &c., weighing in all 28 tons, were transferred to country carts drawn by bullocks. Sixty carts were procured at Jubbulpore, and on the 20th of December the march was commenced to Sanchi about 180 miles distant. On 7th January, 1870, Sanchi was reached, and the work of casting commenced. The cast was completed on the 21st February, 1870, and reached London, *vid* Hoshungabad, Bombay, Suez Canal, and Liverpool, early in June. Three copies were then made by October of the same year. The process of making elastic moulds with gelatine was employed both at Sanchi and in the repetition of copies in London."

It seems that on the card of invitation, to "a private view of the cast of the eastern gateway of the Sanchi Tope from Central India (erected 500 B.C.)" Mr. Fergusson read the date of 500 B.C. as applicable to the gateway rather than the Tope itself. ASIATIC.*

ST. PAUL'S CHURCHYARD.

IT is anticipated that the proposed improvement at St. Paul's Churchyard, by throwing open the enclosed area at the western end of the cathedral, will shortly be carried into effect. The dean and chapter offered the ground to the Commissioners of Sewers for 20,000*l.*, and the latter body applied to the Metropolitan Board of Works for a contribution towards this amount; but the Board declined to make any grant unless the dean and chapter consented to throw open the roadway on the northern side of the cathedaal for carriage traffic. The finance and improvements committees then intimated to the chapter that, under the circumstances, they were prepared to recommend the commissioners to pay 15,000*l.* for the ground instead of 20,000*l.* Before coming to any conclusion on this proposal, the cathedral authorities have written to inquire whether they are to understand that, in the event of their assenting to the opening of the roadway on the northern side for carriage traffic, the Commissioners of Sewers will be prepared to provide the larger sum, viz., 20,000*l.*; and the finance committee recommended that this question be answered affirmatively. The Commissioners of Sewers have approved of this recommendation.

MANUFACTURERS' NAMES IN ARCHITECTS' SPECIFICATIONS.

SIR,—I wish you would lend us your powerful assistance in sweeping away the above practice, as a pernicious relic of bygone days—wrong in principle, and seldom justifiable in actual practice. I believe professional men of the metropolis have advanced beyond this stage, and do not bind their builders to any one name, but insert provisional clauses for good quality, which are just as efficacious, and far more just.

In the country it is not so. I could name five or six architects in one town (and the leading men as well) who copy, in stereotyped form, specifications one after another, and have so copied them from their early youth upwards with a most serene indifference or ignorance of the progress of manufactures for the past ten years or more.

This should not be. The results are—1. That the maker named charges more than the fair competitive price, for which the employer and not the builder pays. 2. That the practice opens the road to bribery, or at least the imputation of bribery, which the profession should avoid. 3. That it is in itself opposed to the English notion of justice and fairplay. 4. That the system is opposed to free-trade and the improvement in manufactures. 5. That it leads architects to rely on a name, instead of making themselves acquainted with the properties of the article itself, and thus narrows their practical knowledge. 6. That it is not necessary in the present day, as, with the exception of recent patents, few makers are so pre-eminent in any manufacture as to be entitled to a sweeping preference in opposition to the principles before mentioned.

Let a standard be adopted, or a sample submitted, that the competition may be open and fair to all.

I trust these remarks may induce some architects to reconsider their position in this matter.

A MANUFACTURER.

* In Mr. Fergusson's communication, for "Christian Crusade," read *Christian Era*.—ED.

STAINED GLASS.

Christchurch, Fulwood.—Three memorial windows, according to the *Sheffield Independent*, have been placed in this church, in memory of the late Mr. Wm. White, and formally inaugurated. Mr. White was a prominent Freemason, and the founder of several lodges, the members of which have testified to the high admiration and esteem in which they held him by raising this tribute to his memory. The windows selected are the central three of the five on the south side of the church, immediately under which lie the remains of the deceased. The subject of the centre window is King Solomon, crowned and in his royal robes, holding in the right hand a sceptre, and in the left an orb. Each of the other two windows contains three Masonic emblems,—the golden double-headed eagle, the triple tau, the double triangle, the pentalpha, the pelican, and the lamb on the book of seven seals. The windows are from the manufactory of Messrs. Heaton, Butler, & Bayne, of London; and the cost will be 100 guineas.

Queensbury Church.—A memorial window has been placed in this church, in memory of some of the family of the late Mr. John Greenwood, of Queensbury. The window, which is by Messrs. Ward & Hughes, of London, has been appropriated to the three Resurrections,—viz., the raising of the widow's son, the raising of Jairus's daughter, and the raising of Lazarus.

Roman Catholic Church, Warwick.—Three stained windows have just been executed for this church, by M. Dury, artist, Warwick,—one of St. Joseph, in the chancel, and two others in the west end of the church, representing the Annunciation and the Nativity. These, in conjunction with two others by the same artist, of the Repose in Egypt and the Life in Nazareth, form a series representing the Infancy of our Lord.

Trinity United Presbyterian Church, Greenock.—A large stained-glass window for the south end of this church, now approaching completion, has just been finished by Messrs. Ballantine & Son, of Edinburgh. The window consists of five upright lights, with extensive and elaborate top tracery. The five leading compartments contain illustrations of Scripture history, consisting of Moses with the Tables of the Law, Samuel anointing David, Christ's Sermon on the Mount, the Angels announcing to the Marys the Resurrection of Christ, and Paul Preaching at Athens. These subjects are all surmounted with elaborate canopies, and in four of the base panels are emblems of the Trinity, while in the central panel beneath the illustration of Christ's Sermon on the Mount is an angel bearing a scroll with the inscription, "Come unto me, all ye that labour and are heavy laden, and I will give you rest." In two leading forms of the top tracery are illustrations of the Sacrifice of Isaac and of Elijah Raising the Widow's Son. There is no enamelling, all the colours being pot-metal. The ornamental portions are all architectonic, and in harmony with the Early English Pointed style of architecture of the building. The draperies and grouping of the figures, with the expression of the countenance are treated in the Mosaic style.

Bapchild Church.—A stained-glass window, the gift of Mr. James Lake, of Newlands, has been inserted in the west end of this church. It is in memory of the donor's father, Mr. John Lake. The subjects represented are St. Peter and St. Paul, on either side respectively, and the Patron Saint (Lawrence) in the centre.

Christ Church, Moss-side, Manchester.—The interior of this church is being enriched by the insertion of two sets of memorial windows, which fill the lights of both transepts. The windows are in memory of the late wife and daughter, and two daughters-in-law, of Mr. William Wilson, of King-street and St. James's-square, and of Grove House, Greenheys. The three lights in the south transept form one monument in memory of Mrs. Wilson, comprising groups emblematical of the three Graces—Faith, Hope, and Charity; and those in the north transept are separate monuments in memory of the three younger members of the family, being scriptural representations of Affection, Belief, and Obedience, as illustrated by leading scenes in the lives of Ruth and Naomi, Mary of Bethany, and the Virgin Mary. The designs are by Mr Linklater, of the firm of Price & Linklater, architects, and the work has been executed by the Messrs. Edmundson. The windows have been presented by Mr. Wilson.

Books Received.

Victoria: Patents and Patentees. Vol. III. *Indexes for the Year* 1868. By W. H. ARCHER, Registrar-General of Victoria. Melbourne. 1870.

Victoria: Abstracts and Specifications of Patents applied for from 1854 *to* 1856. *&c to &c.* By W. H. ARCHER. 1870.

THE second of these blue-books contains abstracts of the patents for building materials, the most numerous division of which relates to bricks, mantelpieces, tiles, artificial stones, &c.; and the next to cements. The Indexes for 1868 are divided into three parts,—a subject matter index, an alphabetical, and a chronological index.

VARIORUM.

CASSELL'S "Technical Educator" has the following remark on "the study of the beautiful, and its practical value:"—"At the very outset we must recognise the fact that the beautiful has a commercial or money value. We may even say that art may lend to an object a value greater than that of the material of which it consists, even when the object be formed of precious matter, as of rare marbles, scarce woods, or silver, or gold. This being the case, it follows that the workman who can endow his productions with those qualities or beauties which give value to his works, must be more useful to his employer than the man who produces objects devoid of such beauty, and his time must be of higher value than that of his less skilful companion. If a man, who has been born and brought up as a "son of toil," has that landable ambition which causes him to seek to rise above his fellows by fairly becoming their superior, I would say to him that I know of no means of his so readily doing so, as by his acquainting himself with the laws of beauty, and studying till he learns to perceive the differences between the beautiful and the ugly, the graceful and the deformed, the refined and the coarse. To perceive delicate beauties is not by any means an easy task to those who have not devoted themselves to the consideration of the beautiful for a long period of time; and of this be assured, that what now appears to you to be beautiful, you will shortly regard as less so, and what now fails to attract you, will ultimately become charming to the eye."

——"The City Diary," published by W. H. & L. Collingridge, of the *City Press*, has again made its appearance. In addition to the matter ordinarily given in a diary for the desk, it contains much official information with regard to the City. It is a complete guide to the various business offices of the Corporation and City generally.

Miscellanea.

The Baptist Mission-house, Holborn.—This new building is situated in Castle-street, Holborn, and has been erected from the designs of Messrs. Searle & Son. On passing through the vestibule, the main office is to the right. It is about 30 ft. square. To the left of the lobby are the secretaries' rooms. Immediately opposite there is a large and comfortable waiting or reading room. Fronting the entrance is the library. This is about 48 ft. long by 30 ft. wide. It is surrounded by a gallery. Bookcases occupy all the bays formed by the piers on which the roof rests. The room will accommodate 300 persons. Ascending the stone staircase, we first come to the doors, which admit to the gallery of the library. On the main landing is the committee-room, about 37 ft. by 22 ft. There are other offices above this landing. Five offices, together with the housekeeper's apartments, occupy the second floor, and the top floor is wholly devoted to rooms of a domestic character. The site for the new premises cost 4,500*l.*, and the estimate for the structure is 8,347*l.*

The Bradford Gasworks.—The Bradford Gas Company have agreed to sell their undertaking to the corporation for 210,000*l.*

To Take Plaster Casts of Natural Objects.—At the Manchester Literary and Philosophical Society, Mr. Boyd Dawkins exhibited a number of casts in plaster of Paris of various objects of natural history, and explained the process by which any one can make them for himself. The material of the mould is artists' modelling wax, which is a composition akin to that used by dentists; and, as it becomes soft and plastic by the application of heat, though in a cold state it is perfectly rigid, it may be applied to the most delicate object without injury. As it takes the most minute markings and striations of the original to which it is applied, the microscopic structure of the surface of the original is faithfully reproduced in the cast. This method is briefly this:—1. Cover the object to be cast with a thin powder of steatite or French chalk, which prevents the adhesion of the wax. 2. After the wax has become soft, either from immersion in warm water, or from exposure to the direct heat of the fire, apply it to the original, being careful to press it into the little cavities. Then carefully cut off the edges of the wax all round, if the undercutting of the object necessitates the mould being in two or more pieces, and let the wax cool with the object in it, until it is sufficiently hard to bear the repetition of the operation on the uncovered portion of the object. The steatite prevents the one piece of the mould sticking to the other. The original ought to be taken out of the mould before the latter becomes perfectly cold and rigid, as in that case it is very difficult to extract. 3. Then pour in plaster of Paris, after having wetted the moulds to prevent bubbles of air lurking in the small interstices; and if the mould be in two pieces, it is generally convenient to fill them with plaster separately before putting them together. 4. Then dry the plaster casts either wholly or partially. 5. Paint the casts in water colours, which must be fainter than those of the original, because the next process adds to their intensity. The delicate shades of colour in the original will be marked in the cast by the different quantity of the same colour, which is taken up by the different textures of the cast. 6. After drying the cast, steep it in hard paraffine. The ordinary paraffine candles, which can be obtained from any grocer, will serve the purpose. 7. Cool, and polish the cast by hand with steatite. The result of this process is said to be far better than that obtained by any other.

An Ancient Bronze Plate, with Runes found in Ireland.—An interesting antiquarian discovery has been made on Lord Rathdonnell's estate at Gormanstown, county Louth. In an ancient mound, consisting of the materials of an old sea-beach, were found mingled some charcoal and many broken and half-burnt bones, &c. About 11 ft. from the surface, or top, of the mound the excavators came upon a small bronze plate lying upon what the finder likened to an edging of snuff-coloured dust or burnt paper. This plate on being carefully cleaned, was found beautifully ornamented on one side in silver tracing, with the involuted "whorls" and twistings so common on the very ancient Irish monuments, and particularly at Monasterboice, formed by the interweaving of a triple cord. On the other side it bore, in clear and well-defined Runic characters, an inscription which has been translated as follows:—"Tomi (or Tomri) of Solshof owns this sword." The snuff-coloured powder lying about the plate was entirely the remains of the sword-belt. The plate has been transmitted to the Society of Antiquities in Copenhagen; and the opinion of the best Runic scholars is to the effect that it belonged to "Tomar of the Torque," of Dublin, Earl Tanist to the King of Lochlaun, in the ninth century of the Christian era, and the Danish chieftain alluded to by the poet Moore as having the collar of gold torn from his neck by King Malachy. The question has been started, why was Tomar interred at ancient Drumcath, or how came a portion of his sword to be found there? The subject is to be brought before the Archæological Society of Kilkenny.

Surveyorship, Croydon.—The surveyorship of the borough of Croydon having become vacant, by the resignation of Mr. Albert Latham, the Local Board of Health requested their consulting engineer, Mr. Baldwin Latham, C.E., to nominate five gentlemen from whom a selection might be made. From these the Board, at their last meeting (20th instant), elected Mr. Thomas Walker, borough surveyor of Rochdale, to fill the same office at Croydon.

The Salt Library.—A public meeting of the inhabitants of Staffordshire, convened by the high sheriff, has been held at the Shire-hall, Stafford, for the purpose of publicly thanking the widow of the late Mr. Salt, of the firm of Messrs. Stevenson, Salt, & Co., bankers, London, and Stafford, for her munificent present of books, engravings, antiquarian works, and very costly documents relating to Staffordshire, collected by her husband at an expense of upwards of 31,000*l.*, and to determine the best mode of raising an adequate fund for their preservation and utilisation. The high sheriff, Mr. J. Hartley, presided, and there was a very numerous and influential attendance. The Earl of Harrowby moved a resolution affirming the advantage of retaining within the county the splendid collection of Mrs. Salt. The resolution was seconded by Colonel Bagnall, and carried unanimously. The Earl of Dartmouth moved the appointment of a committee, consisting of the Duke of Sutherland, the Earls of Lichfield, Shrewsbury, Bradford, Harrowby, and Dartmouth, Lords Hatherton, Wrottesley, and Bagot, Viscount Sandon, M.P., and many other influential inhabitants, with a view to considering in what way the conditions which Mrs. Salt attached to her gift might be best complied with. The mayor of Stafford (Mr. H. Gillard) seconded the resolution, which was carried unanimously. Lord Hatherton, in moving that a subscription be at once entered into, observed that Mrs. Salt's wish was, that the library should be safely deposited in a building erected especially for the purpose, or some appropriate existing institution either at Stafford or Lichfield, and that a librarian should be appointed. Mr. A. Sparrow seconded the resolution, which was cordially agreed to. The Earl of Lichfield moved that, with a view to providing a fitting memorial of the late Mr. William Salt, by the erection of a suitable building for the library and the endowment of a librarian, the meeting should pledge itself to take immediate steps to raise a sum of not less than 7,000*l.* He considered a building worthy of the library would cost at least 4,000*l.*, and a farther sum of 3,000*l.* ought to be raised as the nucleus of an endowment fund. Mr. Cartwright seconded the resolution, which was carried with acclamation. A subscription was entered into, and about 1,000*l.* were promised in the room, including the Rev. Walker Sneyd, 105*l.*; the Earl of Lichfield, 100*l.*; the Earl of Dartmouth, 100*l.*; and the Earl of Harrowby, 100*l.*

Gas Fires and Stoves.—Mr. J. O. N. Rutter, of Black Rock, Brighton, gives the following, with other particulars, as to useful forms of gas fires and gas stoves. The gas fire consists of pumice (usually called pumice-stone), broken into tolerably small pieces, packed together to the height of the bars in an ordinary fire-grate, and heated to incandescence by gas. The pumice being carefully arranged, and the gas properly applied, in a few minutes there will be a brilliant fire. Here will be nothing to disturb our old-fashioned notions and susceptibilities about the cheering effects of an open fire,—a fire which can be seen as well as felt. The cost of materials and workmanship is very trifling,—only a few shillings; but the cost of keeping up the fire is greater than that of a coal fire. Taking the cost of a coal fire at ½d. per hour, that of a gas fire will be about 1⅛ of a penny. This must be taken into consideration when estimating the advantages of a gas fire. The pumice rapidly gets into a glow, and is nearly indestructible, without dust or other nuisance, and the fire gives good heat and can be diminished or increased at will. Mr. Rutter also thus describes a gas stove:—

"During the last twelve winters I have had the enjoyment of a stove which is isolated as respects the room in which it is fixed. The air which supplies the means of combustion to the gas-jets is conveyed from out-of-doors, underneath the floor, and through the bottom of the stove; and the exit-flue communicates with the chimney of an adjoining room. The perfection of warming by gas is thus attained. Any required temperature can be maintained without varying one degree for any required period. . . . . A room which has no chimney, nor one near enough to be available, can be effectually and healthfully warmed; and a room with a chimney, but useless by reason of down-draught, may be made as comfortable as any other in the house."

With such a chimney a gas fire does not do well.

Cottage Hospitals.—Mr. Sotheron-Estcourt has just presented to the Devizes Corporation a site for the establishment of a cottage hospital at that place. The gift has been accepted, and funds are being raised to defray the cost of the erection. These institutions have spread since we first began to urge their value.

The Education Movement.—Last week the Lord-Lieutenant of Warwickshire, Lord Leigh, presided at the College, Binswood, Leamington, on the opening of the new boarding-house, which now forms the western side of the quadrangle of the extensive building, in this fashionable inland watering-place. The head-master, the Rev. H. G. Woods, Fellow and Tutor of Trinity College, Oxford; J. R. Thursfield, B.A., Fellow and Tutor of Jesus College, Oxford; and other well-known educationalists took part in the proceedings. A number of scholarships were awarded to the most successful students, the annual speeches made, and prizes given. The new boarding-house has the residence of a master attached to it, under whose management it will be conducted. The basement and ground-floor contain various requisite offices, also a dining-hall, a school-room, as well as several private studies, which will be placed at the disposal of the most diligent boys. The upper floors contain forty dormitories, bath-rooms, and other apartments; also separate rooms for invalids. The whole is heated with hot water.

The Rating of Government Establishments.—It is understood that it is the intention of her Majesty's Government to introduce a measure into Parliament for the purpose of removing the exemption which exists in the case of Government property from the payment of parochial rates in connexion with other exemptions. Believing that the other exemptions (under which comprehensive head charities, parks, and other things are included) are likely to give rise to so lengthened a discussion in the House of Commons as materially to retard the settlement of that which is in itself a very simple and pressing question,—viz., the rating of the public works, which, being established for the benefit of the whole nation, ought in all their collateral charges to be a burden upon the nation, and not upon any particular locality. The Premier is being urged to deal with this subject by a separate Bill, which would be almost certain to command the support of all parties in the House of Commons. We hope the suggestion will be early acted on.

Property Sales.—Mr. Parker Tomlinson offered for sale, at the Red Lion Inn, Retford, a property situated in South Leverton, and Treswell. All the lots were ultimately sold. Lot 1, a farmhouse, orchard, &c., and three closes of grass land, in all 12a. 0r. 12p., was knocked down to Mr. T. Smith, for 1,050*l.* Lot 2, 3a. 2r. 8p. of grass land was purchased by Mr. Smith for 95*l.* per acre. Lot 3, a close of arable land, 3a. 2r. 22p.; Mr. Turner was the last bidder at 54*l.* per acre, but it was reserved for 58*l.* Lot 4, 7a. 2r. 13p. of arable land was purchased by Mr. J. Bomford for 54*l.* per acre. For lot 5, 4a. 1r. 23p. of grass land, Mr. J. Q. Wells was the last bidder at 92*l.* per acre,—reserved at 95*l.* Lot 6, 35a. 0r. 4p. of arable land, was purchased by Mr. George Scott at 66*l.* per acre.—— Mr. Sheppard sold at the Bull's Head Inn, in Loughborough, in two lots, a freehold estate, situated in the parish of Hoton, and containing 44 acres. Lot 1, 30 acres of land, with farmhouse and buildings, realised 92*l.* per acre. Lot 2, 14a. 2r. 21p., sold for 96*l.* per acre. Colonel Packe was the purchaser.

The Bridge over the Severn at Welshpool.—The mayor of Welshpool and the town clerk have had a meeting with Mr. John Naylor, at Leighton Hall, with reference to the proposed bridge over the Severn. Mr. Naylor said he would give them the ground on both sides the Severn, for the abutments and necessary approaches to the bridge, and also "the ferry," which brings in 40*l.* a year to Mr. Naylor at the present time. The mayor has opened a subscription list, and has been promised between 300*l.* and 400*l.* already. The bridge is intended to be toll free. Thirteen lives have been lost, within the last fifteen years, by persons attempting to cross the Severn at Leighton Ford, the site of the intended bridge. Lord Powis has promised to give the subject his best consideration. We believe the total cost will be about 3,000*l.*

New Schools, Newport, Salop.—We are informed that in answer to advertisement thirty-four sets of plans were received by the committee, and that they have awarded the premium to Mr. John Ladds, of Chapel-street, Bedford-row, and have instructed him to prepare specification and details for carrying out the works.

Arbitration Case, Bolton. — Mr. Isaac Holden, of Manchester, sat as umpire in a dispute between Messrs. Day & Raby, joiners, of Crown-street, Bolton; and Messrs. Ellis & Hinchliffe, builders, of Manchester, arising out of a contract for the carpenters' and joiners' work for the new County Court buildings in Mawdsley-street. The amount claimed for extra works by Messrs. Day & Raby was 934*l*. After several meetings, we understand that the case has now been settled by the umpire awarding to the plaintiffs the sum of 14*l*. 5s. 10d.; the costs, which we understand amount to 300*l*., being divided equally between the disputants. Mr. James Lomax, surveyor, of Bolton, was arbitrator for Messrs. Day & Raby; and Mr. Thomas Taylor, surveyor, of Manchester, for Messrs. Ellis & Hinchliffe.

Instruction in Science and Art for Women.—In the eleventh (the last but one) of his course of lectures on the elements of physical science, or "Physiography," delivered at the South Kensington Museum, Professor Huxley examined the geological features of the basin of the Thames, and pointed out some of the climatic and physical changes which, in common with the rest of Britain and Northern Europe, it must have undergone in the course of past ages. In the Thames basin were found remains of the arctic musk sheep, bison of America, and rhinoceros of Asia, which also has been found "in the flesh," frozen up in floats of ice for thousands of years.

Sanitary Improvements in St. Pancras since 1855.—There has been printed, by authority, the copy of a letter from the Metropolitan Board of Works with a series of questions as to the sanitary and general improvements effected by the vestries from the passing of the Metropolis Management Act, 1855, with the replies given on behalf of the vestry of St. Pancras. From this document it appears that the total amount expended in sewerage, paving, and other improvements in the parish since 1st January, 1856, including the cost of public lamps to Lady-day, 1870, is 884,774*l*. The present mileage of streets and roads in the district is about eighty miles.

The Holborn-circus Branch of the Union Bank of London.—This building, on the Viaduct, occupies a site of 132 ft., with a depth of 68 ft. The design of the building is Italian in style, and the material used in the elevation is Portland stone. The basement is to be used for the reception of safes and as strong rooms. The ground floor will be devoted to the purposes of the bank, and a large portion of the building will be let out as offices and for general business. Mr. F. W. Porter is the architect. The floors are on Messrs. Fox & Barrett's principle, with blue lias lime concrete of Mr. W. Lee's manufacture. The contractors for the building are Messrs. Holland & Hannen. The carving is being executed by Mr. Kelsey, and Mr. Brodie is clerk of the works.

Royal Academy of Music.—The competition for the Westmoreland Scholarship and Potter Exhibition took place on Monday, the 19th instant, at the Institution in Tenterden-street, Hanover-square. The results were as follow: — Westmoreland Scholarship — Miss Mary Crawford (elected), Miss Pocklington, Miss Rebecca Jewell, Miss Frith, and Miss Goode (highly commended). Potter Exhibition —Miss Agnes A. Channel (elected), Miss Field, Miss Taylor, Miss Gardner, and Miss Waite (highly commended).

Condition of Liverpool.—We have already mentioned that Professor Huxley, as President of the British Association, was requested by the Town Council of Liverpool to nominate two gentlemen to report on the propriety of using ashpit refuse as the foundation of new houses in Liverpool. We understand the Professor has named Professor Parkes, of Netley, and Dr. Sanderson, of University College. The Town Council have further resolved to take the opinion of these same gentlemen on the sanitary condition and ventilation of the sewers.

The Working Men's Exhibition.—A workman complains that a model sent by him, and exhibited in the Agricultural Hall, was returned to him damaged, and not in his own case. Exhibitors must make allowances for officials in such circumstances. The wonder, perhaps, is that the committee were brave enough to take upon themselves the onerous duty of returning objects exhibited.

Sturston Church, Norfolk.—This church having just been restored and a new aisle added, the builder, Mr. George Grimwood, gave the men in his employ a dinner. Upwards of sixty sat down. The chair was occupied by Mr. Grimwood, supported by Mr. William Boatwright, of the firm of Jecks & Ranson. Mr. Johnson and Mr. Gostling responded for the carpenters, and Mr. Rust and Mr. Middleton for the bricklayers, who spoke to having served Mr. Grimwood for twenty-five years, and they hoped to serve him as many more. The architect was Mr. R. M. Phipson.

Architectural Association.—On Friday evening, the 16th, a paper was read by Mr. S. Salter "On the Arrangement and Ventilation of Hospitals." After referring to the several plans upon which hospitals were constructed, and pointing out the advantages of the pavilion system, he proceeded to describe more particularly the arrangements adopted in the new St. Thomas's Hospital by Mr. Currey; the Small-pox Hospital, at Stockwell, by Mr. T. H. Wyatt; and the Fever Hospital, also at Stockwell, by Mr. Marrable; several drawings of which, showing the construction, plan, and ventilation, were kindly lent for the occasion by the architects.

Improvement of Park-lane.—A correspondent, "J. A. A.," proposes a plan, similar to one we illustrated in the early stage of the discussion, for obtaining a better thoroughfare by commencing it on the west side of Apsley House, and running into Park-lane at Stanhope Gate. It would be worse than useless now to reopen the question. All the arrangements are made for effecting the desired improvement by means of Hamilton-place.

Early Settlements.—During the operations for draining off a tarn at Ehenside, near Egremont, Cumberland, the remains of an ancient British settlement have been discovered. Stone and flint implements, such as axes, knives, and chisels, have been found in large numbers. Some pieces of oak are cut in lengths, evidently from massive full-grown trees such as have not grown in that locality for many ages.

The Tower of St. John's, Chester. — The state of this tower having been found to be very dilapidated, a meeting of parishioners has resolved to take immediate steps for its repair; and to that end a committee has been appointed to obtain an architect's report on the state of the tower.

British Archæological Association.—At the next meeting, on Wednesday, January 11, 1871, Mr. W. F. Holt will read a paper on "The Tames of Fairford."

Works at Marlborough House. — A "Looker on" sends us a somewhat mystical letter as to the terms on which the men are employed by the builder at Marlborough House.

TENDERS.

For building a thirty-quarters malthouse at the Queen-street Brewery, Ramsgate, for Messrs. Tomson & Wotton. Mr. Benjamin Adkins, architect. Quantities supplied by Mr. Thomas M. Rickman:—

Smith & Son	£2,935 0 0
Wilson	2,698 0 0
Epps	2,665 0 0
Harrison	2,650 0 0
Osborn	2,360 0 0
Shrubsole	2,347 0 0
Snell & Rayte	2,347 0 0
Adcock & Rees	2,313 0 0
Saunders	2,293 0 0
Hayward (accepted)	2,145 0 0
Woodcock	2,087 0 0

For the erection of bakehouse, oven, and other buildings, at Carshalton, Surrey, for Mr. Dyett. Mr. Bunker, architect:—

Cuff	£318 0 0
Noble	239 0 0
Richardson	237 0 0
Kell (accepted)	235 0 0

For gasfittings and ventilating tubes at the new Infirm Wards, St. Luke's Workhouse. Mr. H. Saxon Snell, architect:—

Pontifix	£379 10 0
Turner & Co.	320 0 0
Garnett	285 0 0
Crabb & Vaughan	284 0 0
Jeal	259 0 0
Abercombie	232 8 0

For alterations and repairs to the house, No. 58, Upper Marylebone-street, for Mr. Alfred Yates. Mr. A. Baker, architect:—

Hatchman & Son	£625 0 0
Houghton	527 14 0
Hyde	499 0 0
Scrivener & White	498 0 0
Watson, Brothers	428 10 0

For new factory, &c., at No. 402, Hackney-road, for Messrs. W. Williams & Son. Messrs. Lee & Walton, surveyors:—

Axford	£630 0 0
Ramsey	574 0 0
Blackmore & Morley	525 0 0
Shurmur (accepted)	494 0 0

For engineering works, gasfittings, laundry-fittings, cooking apparatus, &c., for the workhouse of the Woolwich Union at Plumstead. Messrs. Church & Rickwood, architects. Quantities supplied:—

Rosser & Russell	£3,578 0 0
Deane	3,523 0 0
Jeakes & Co	3,511 0 0
Fraser & Sons	3,370 0 0
May	3,306 0 0
Benham & Sons	3,010 0 0
Stiff (accepted)	2,932 0 0

For dispensary and relief offices at Woolwich, for the Woolwich Union. Messrs. Church & Rickwood, architects. Quantities supplied:—

Crockett	£2,940 0 0
Stiff	2,894 0 0
Sollett	2,835 0 0
Perry & Co.	2,797 0 0
Hart	2,778 0 0
Henshaw	2,774 0 0
Kirk	2,759 0 0
Stephenson	2,742 0 0
Eaton & Chapman	2,607 0 0
Nightingale	2,626 0 0
Wright, Brothers, & Goodchild	2,590 0 0
Lonergan	2,582 0 0
Avard	2,550 0 0
Tongue	2,490 0 0
Wilson	2,410 0 0
Hurst	2,373 0 0
Crabb & Vaughan (accepted)	2,290 0 0

For new dead-house and post-mortem room, All Saints', Poplar. Messrs. A. & C. Harston, architects:—

Abrahams	£295 0 0
Riddall	264 0 0
Coleman	263 0 0
Hodges & Robinson (accepted)	250 0 0

For the rebuilding of No. 304, Strand. Mr. J. H. Rowley, architect. Quantities supplied by Mr. Green:—

Sharpington & Cole (accepted)	£968 0 0

TO CORRESPONDENTS.

Honoris Causa (it is beyond our province to tell architects what they should charge. We should run the risk of misleading if we did so. Look to the schedule issued by the Institute. If employer did not request specification, directly or indirectly, charge for it could not be enforced).—Country Architect (first part of the last reply will serve as answer).—F. H. (send in a written application and copies of testimonials).—P. J. H. C. (*Cliché* has been sent).—G. R. (shall have attention next week).—A. Y. N. (too late; after notice in every newspaper).—A. S. (cancelled, having appeared elsewhere).—J. R. C. (we looked to receive a fuller report).—L. Builder (we do not give recommendations).—H. H. S.—W. H.—J. R.—H. K.—T. J.—H. A. C.—W. F. P.—C. S.—L. & W.—C. & R.—W.—M. & Son.—G. M.—S. S.—Mr. R.—M. Y. F.—R. K. F.—J. T. F.—T. C.—T. T.—F. R. W.—R. R. C.—G. J. L.—T. S.—H. B.—A. H.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Builder.

VOL. XXVIII.—No. 1456.

Eighteen Hundred and Seventy.

THE year 1870 closes a decade more eventful than almost any period of equal length in the history of the world. Its opening was marked by the outburst of a civil war, unprecedentedly sanguinary in its conduct. It witnessed revolutions in Greece and in Poland. It saw the unscrupulous spoliation of the gallant little kingdom of Denmark. It beheld the extinction, on the field of Sadowa, of the hopes of the House of Hapsburg to revive the dignity of the Holy Roman Empire, after its downfall at Austerlitz. It has watched the slow consolidation of Italy; the collapse of the histrionic second empire in France; the blasphemous claim to divine honours grasped at by the Pope, and the overthrow of the temporal power wielded by that Pontiff for eleven hundred years. It has seen Germany reconstructed as an empire, and aggressive France prostrate, but still unsubmissive, at her feet. It has measured the influence, on two rival nations, of a cycle of eighty years of constant revolution, compared with that of an equal period of careful culture under firm monarchical rule. It has seen the metropolis of civilisation cut off from the outer world by a circle of steel and of fire, and only giving signs of its existence by means of balloons and pigeons. It has so exhausted our capacity for wonder, that our ears no longer tingle at the most unexpected or most disastrous news.

The thunderbolt of war burst, in a serene sky, as the sun declined from the summer solstice. As he passes that of winter, obscured by eclipse (and, the wisdom of our ancestors would have added, in portentous conjunction with Saturn, and square of Mars), it is hard to tell in which portion of the horizon to look for hope or for promise. The two master forms of evil, which were thought to some extent to displace one another, now reign unchecked, in unholy wedlock. Violence and deceit walk hand-in-hand. The successive rulers of France have each eclipsed their predecessors in mendacity. The long series of rapacious robberies by which the House of Hohenzollern has risen from the burgravate of Nuremberg to the headship of Germany, is now gilded by the lustre of the crown of Charlemagne. The doctrine of the duty of fidelity to treaty, up to the moment when it is convenient to break faith, has been avowed with the like cynical shamelessness by the ministers of both the great Northern powers. A war, in which attack and defence seem now alike objectless and wanton, is sapping the life-blood of Germany and of France; nor have we any ground for belief that our own military or naval preparation is such as to render us wisely indifferent to the menacing unfriendliness of nations envious of our insular wealth.

The year 1870, thus one of the most eventful of this eventful decade, has left no trifling marks of its passage on the face of our island. For the first time since the introduction of the sham and stucco of the regency, London has of late burst the fetters of negligence and of bad taste. While yet leaving much to be desired, she has, at a single stride, assumed no inferior place among the architectural capitals of Europe. And if the year has afforded to the architect, the man of taste, and the friend of education, ample material for regret, and even for humiliation, it has not been without compensation in its monumental gifts.

Eighteen hundred and seventy has witnessed the completion, or the first opening to public traffic, of national works of the first magnitude, and of considerable, if not unqualified, merit. The close of the preceding year removed the long-endured reproach of Holborn-hill, and bridged the Thames with an elegant successor of the dilapidated structure at Blackfriars. The completion of the road along the Thames Embankment, and the opening to the public of this esplanade, must be regarded as a complement of the City improvements. The broad straight line pierced from the Bank and the Mansion House, towards the commencement of the Embankment road, is another link in the improved internal communication. At the same time the underground story occupied by the Metropolitan Railway, has given a facility to the intercourse between the two great centres of metropolitan life, which we are only beginning to appreciate. When the inner circle is complete, punctuality will be possible in London, and the time-honoured trouble of a block in the streets will lose its terror for the man of business.

The directors of the Metropolitan Railway deserve honourable mention. Their free and liberal treatment of the public, especially in the case of return-tickets, contrasts in a striking manner with the griping policy of the Charing-cross and Cannon-street management. The division of the line into sections, and the permission for a passenger to use the same ticket over the same section without extra charge (as, for instance, if he has taken a return-ticket from Charing-cross to Kensington, he may return with it to the Temple), will be fully appreciated by the public.* Add to this the very wise provision which Mr. Fowler has made (by the introduction of the ponderous engines which are as well adapted for this duty as they would be extravagant for any other) for almost instantaneous stopping and starting, and the absence of the ill-advised running of line athwart line, which renders the distance between London Bridge and Cannon-street more easy to pass on foot than by railway, whenever a fog comes suddenly on. There can be no doubt that the Underground Railway will, on its completion, monopolise the main traffic between Westminster and the City.

With the facility afforded to the metropolitan traffic by the opening of new lines, both of street and of railway, must be coupled the relief afforded to the residents and occupants of certain parts of the City itself from a curse which is even more heavy than that of smoke,—the noise of London. The winter will, no doubt, severely test the durability of the asphalte laid down in Cheapside, Threadneedle-street, and some other localities. But unless it cuts up into impracticable ruts in a manner not at present threatened, this asphalte appears likely to supersede the more ancient and noisy method of metropolitan paving. The relief to the nerves accomplished by the substitution must add even to the durability of life, by ministering to its comfort. Let any one who doubts this view take a seat in an omnibus at the Mansion House, and allow himself to be driven westward. The explosion which will stun him when the vehicle comes upon the stones near the black effigy of Sir Robert Peel will be a better measure to his senses of the value of a quiet road than he will gain in the converse case of leaving the rattle for the calm.

The proposal to complete the internal decoration of St. Paul's Cathedral met with a response, the cordiality of which has slackened as the subscriptions were brought to book. Only about an eighth part of the large sum asked for has yet been offered. The public has not yet been hit in the right place.

The degree of success which has attended the opening of a Workmen's International Exhibition at Islington has not been such as to lead to the confirmation of the opinion that the leaders of the working classes are yet in a position to take the reins of power. Of that Exhibition we speak in all sympathy and kindness. Its object, so far as it had a distinct and avowed object, was good. Men remarkable for influential position, or estimable for noble qualities, spared neither time nor trouble to insure success. Shrewd, sensible, practical men, worthy representatives of the industrial classes, laboured as honorary secretaries and committeemen. The Queen paid a pre-opening visit, at the cost of not being able to open in person the most ornamental public work of her reign. The heir to the Throne opened the Exhibition officially. The Prime Minister postponed a cabinet council to make a speech at its close. With all that the Exhibition was a failure. It was so in a financial sense, as the final accounts produced at the close showed a deficit of some 1,500*l.*; but even more than this, it was a failure in an industrial sense. It failed to induce the body of men for whose benefit it was designed to come forward to support it. Containing, as it did, some good native productions, of which the country might well be proud, it relied almost entirely for its attractive power upon foreign contributors,—Italy, Denmark, India, and Austria. Subtract the products of these countries, and there was but little to repay a visit to the Agricultural Hall. And then these very contributors were wroth to the last degree at the company, or, rather, lack of company, in which they found themselves, and scrupled not to complain that they had been induced to go to an expense which was in no way repaid by either the quantity or the quality of the publicity which they obtained. It is true that all these shortcomings may be explained. But they are none the less obstinate for that fact. They show that neither integrity, benevolence, devotion, nor any similar qualities can insure success, in the absence of the genius of organisation and the trained habit of rule.

Undeterred by the failure at Islington, by foreign war, or by domestic alarm, South Kensington has pressed forward its preparations for again inviting the world as its guest; indeed, this time it seems rather to be asking for its company as its lodger. While almost every large manufacturer you meet shakes his head as he tells you that the time of Great Exhibitions is passed, Kensington declares that it has only just arrived, and that, having so arrived, it is to be perpetual. We shall look with no little interest to the issue. As far as the future can be gathered from the present, we should anticipate, from the small area, but excellent arrangement and substantial structure of the galleries built on either side of the northern half of the Horticultural Gardens, together with the French annex, that we shall obtain a sort of chapel of

* This contrasts forcibly with the extra charge imposed on the traveller who arrives at London Bridge from Charing-cross with a Cannon-street ticket, although he has paid the fare demanded for a London-bridge ticket. A short-sighted piece of iniquity.

ease to the Museum itself. The stern and wise resolve not to allow the Loan Courts of South Kensington to be made available for advertising purposes has, no doubt, excluded a large amount of contemporary production, at the same time that it has very much enhanced the value of the class of objects exhibited. Without being in any way admitted to the councils of an administration that seems to prosper and hold its own, looking on in serene and unconcerned composure, while ministries fall, parties struggle, and newspapers comment, we yet think it possible that the main aim of the perpetual exhibition may be to obtain a certain amount of support from manufacturers, affording them the equivalent of free advertisement, without in any way detracting from the high, non-commercial character of the display in the Loan Courts. It may also not have been lost sight of that the best way to render future Great Exhibitions impossible would be a proposal to make such a gathering perpetual.

In its own wide and fully-acknowledged walk, the South Kensington Museum has had the advantage of offering to the public access to some of the chief treasures of two of the most select and most charming picture galleries to be found within the four seas. The most famous pictures of the Marquis of Westminster have a notoriety which is as wide as the love of art itself. The treasures of Lord Eicho are less generally known, but are not less valuable. The public owe no little gratitude to both the owners and the exhibitors of these grand old paintings.

The Art Exhibitions of the year 1870 opened with unusual *éclat* by the display, on the walls of Burlington House, of more than 230 pictures by ancient masters, and by English painters not unworthy to be named along with them. The permanent value, and true pictorial dignity, of portraiture, was especially illustrated from the easels of Vandyke, Gainsborough, Titian, Velasquez, Rubens, and Sir Joshua Reynolds. The new British Institution attracted favourable notice. In the rival water-colour exhibitions a very parallel rank of merit was attained. Later in the year the exhibition of some water-colour drawings, of the old, true style, but of unrivalled excellence, by the Spanish artist Fortuni, gave a lesson to our own draughtsmen of which we hope to see no trifling results in the spring of 1871. The Burlington Fine Arts Club offered a noble contribution to the educational exhibitions of the year, in the highest and grandest walks of art, by the display of original drawings by Raffaelle and Michelangelo, of *fac simile* reproductions of those invaluable originals by a process in which photography has a share, and of some of the finest engravings known to *connoisseurs* in that all but extinct art. Too much attention cannot be directed to the great boon to the art student which is afforded by the heliotype process. Towards the close of the year the exhibition of the Photographic Society showed that the excellence attained by the leading practitioners of this art is still on the increase.

No very noted triumphs of the civil engineer have been recorded in England in the past year. On the contrary, almost the only sign that the profession may be expected to emerge from under the cloud which has settled on Great George-street is the fact, that the Institution has directed attention to the vital question of professional education. At the commencement of the year public attention was still turned to the fall of the girder-roof at King's College, and to the external fractures in the granite columns of the Holborn Viaduct. In April the fall of an arch on the Subterranean Railway at Blackfriars, a more inexcusable disaster than either of the former, attracted comparatively little notice. Attempts to secure public support to the illusory and undesirable projects of railway communication with the Continent, whether by a 30-mile tunnel through the chalk, by an iron-cased subway, by a floating tube, or by any other equally unpractical method, were characterised in our pages as they deserved, and have passed quietly into oblivion. 1870 has made us all the more content with our watery girdle. It is curious to observe how the fallacy of two pleas, on which the supporters of one of these schemes appealed from our practical verdict to the less professionally educated readers of the daily press, has been illustrated by the events of the year. The increased, and apparently irresistible power of torpedo attack has been brought into full evidence; and the idea of political guarantee for physical conditions has been shown to be altogether inapplicable to the nineteenth century. The plan, always advocated by ourselves, of a channel ferry, has been brought forward in a more serious manner, although still without any due appreciation of the magnitude of the questions, that require experimental solution before it will be wise to commence the outlay of any large sum for this purpose. When we were debating on the most rapid mode of reaching Paris, regardless of expense, we little thought that within a few months our only communication with the French capital would be by balloon! Later in the year the failure of the civil engineers of the country to assume the status, influence, and responsibility properly belonging to the profession, was evinced by the most terrible calamity that the English navy has experienced since the loss of the *Royal George*. The daily press, in its long discussion of this sad event, has illustrated in a remarkable manner the defective character of ordinary English education, as evinced by the general absence of even the rudiments of mechanical knowledge among those who are considered competent to guide and inform public opinion. It is from the constructors of America that the most pertinent response to our own remarks on the subject has emanated, in the telling comparison between the structure of the *Captain*, and the "placing a lifebuoy under the feet instead of under the arms of a drowning man."

Our two great provinces of danger, our subterranean and our aquatic dominions, have continued to furnish the usual *quota* of fatal disasters. 1,116 lives have been lost during the year covered by the last returns in our coal-mines, being at the rate of one life for every 93,777 tons of coal raised, or rather more than one death to every eight hours' shift of labour throughout the year. The wrecks and casualties at sea, reported in Lloyd's List, for the corresponding period of time, have been 10,972, exceeding the average total of the three preceding years by 445. Of these casualties, 3,316 have involved total loss or great damage. The ascertained loss of life in these casualties, during the first half of the year only, amounts to 3,346 souls. The returns for the second half-year are incomplete, and the crews of missing ships are not included. This tribute of 7,000 lives is not, however, borne by British commerce alone, out of the 40,000 sailors of our Royal, and the 196,000 of our mercantile, navy, but by that of the whole world, as far as our returns extend.

The foggy season of November and December has been marked by an unusually large number of fatal collisions on railways. In a single fortnight three of these occurrences caused twenty-six deaths, beside numerous injuries. The influx of traffic, gratifying as it is in one respect to all those interested in railways, appears to have reached the limit of the capacity of several of the most frequented narrow gauge lines. The construction of separate tracks for passenger and for merchandise traffic is a necessity that can only be ignored, in many cases, to the great danger of the public. In the meantime the steady neglect of the simple and valuable advice to diminish the large damages paid for casualties by making every railway ticket a policy of insurance, is one of those things which show with how little wisdom, or true economy, Boards are in the habit of administering the affairs of their constituents.

The attention of both the administration and the legislature of the country has been directed, during the past year, in an unusual degree, to the subject of education, both as regards the primary teaching of the hitherto utterly neglected children of the poor, and that superior degree of traditional culture which should characterise the members of liberal professions. It would have been better for the future of the country, as well as for the credit of public men, if any intelligible idea of public duty, or of the real import and bearing of the word education, had been manifest as controlling and ennobling the unworthy tactics of party politics. A great fight took place in the Lower House of Parliament on the subject of the general and compulsory education of the rising generation. The honest earnestness of the vice-president of the Committee of Council of Education carried substantially the measure which he proposed, in face of a many-coloured opposition, each shade and section of which seemed possessed by the idea that an education directed by any religious sect except its own, was worse than any amount of neglected ignorance. But the failure of the measure to provide for any such organisation of the local boards, as should impart to the more torpid and unlettered parts of the island the stimulus to be derived from association with the more active and cultured portion of the community,—a failure which can only be attributed to disastrous political reasons, — bids fair to neutralise some of the good result desired by the supporters of the measure. Unfortunately, we are never likely to have the means of measuring the amount of this loss of available power. When the Bill comes next, after the usual mode of our legislation, to be tinkered and patched, we shall merely be told, with a sort of helpless frankness, that the measure did not work as well as was expected. As we write we receive the intelligence that this neglect of a well-arranged organisation is about to be remedied, as far as possible, by the extension of autocratic centralisation, — the invariable sequel of all theoretic attempts to reverse the natural conditions of Government.

Coincident with the attempt (not leading, but following, the opinions of the working classes) to commence a general system of elementary tuition, has been an attack upon not only eminent professional men, but upon the courtesy and custom of the architectural profession, which has proved that no wise or thorough views of the importance of high culture and superior education have animated certain members of the Government. The attack upon Mr. Barry, rendered more noteworthy by the offensiveness of its manner, springs from a system that tends at the same time to increase the expenditure of the country, to paralyse its defence, and to destroy its finest monuments. The mode of increasing the long delay that has already occurred in the completion of the Wellington monument is another fruit of the same tree. Nor should we dismiss, as irrelevant, the persistent attempts made in official and *quasi*-official quarters to substitute military men for educated architects and engineers, and to represent the functions of the civil architect as reducible to those of a bettermost house painter and decorator. It is true that any attempt to perform the duties of a specially educated class of men, as it always arises from ignorance of their distinctive nature, proverbially brings its own chastisement. But it is none the less humiliating to see such attempts sanctioned—whether actively or tacitly it little matters—by the Queen's servants.

Some light has been thrown, in the way of collection and publication of facts, upon the vitally important questions of sanitary and of agricultural engineering. The stamping out of typhoid fever by the operations of the engineer has become an ascertained possibility. The alleviation, if not the elimination, of phthisis by the drying of wet subsoil, attendant on drainage operations, is also proved. Some little progress has been made in the delineation of maps of health and of disease, of life and of death; and a diminution of the rate of mortality, and a corresponding prolongation of the mean term of human life, have been proved to lie within the power of science. The inordinate length of time during which the Sanitary Commission has been sitting without present result is commented on, and no wonder.

In agriculture, as elsewhere, the steam-engine is gradually but certainly effecting a mighty revolution. The grand leading features of the scientific cultivation of the country—the collection and store of our ample rain supply, the arrangement of a good system of irrigation and of drainage, the general utilisation of sewage, the defecation, banking, and stocking of our rivers, and the systematic provision of artificial methods for drying the ingatherings of a wet August and September, have been little more than indicated, and that chiefly in our own columns. But the spreading use of the steam plough, the application of ingenious modes of economising labour, the increased cleansing of land, and removal of weeds (even to the loss of the picturesque beauty of the scarlet chequering of our cornfields by the poppy); the economy of time, no less than of cost, in ploughing, in sowing, in reaping, in stacking, and in thrashing; the extension of new and lucrative crops, as that of beet (which in France produced a return of nine millions sterling in the year 1869); the economy of seed, and the selection of the better qualities of grain for reproduction,—all these improvements are silently making way. A sum fully equal to the national expenditure might, within a few years, be freely added to the annual income of those who live on and by the land, by the free employment of available means.

We cannot close these notes, which touch but a part of our province, without a word of refer-

...ence to the all-important subject of the organisation of the industrial classes. The rapid growth among us of the large body of operatives, whose sole occupation is that part of the work of the factory which the human hand can perform more deftly than our present machinery, but into which human skill, properly so called, does not enter, is the most unprecedented feature of modern times. It is the introduction of a new element into internal policy. No ancient human institution ever contemplated the occurrence of so portentous a phenomenon. No modern institution has yet been framed to provide for its consequences. During the present rapid development of machinery, this vast army hangs dubiously between the progress of science, and the existing forms of civilisation; ready, on occasion, to declare war against either. By a wise and benevolent education, guided by men who are neither deaf to the great lessons of history, nor blind to the signs of the times—men who study not so much the worst as the best elements of human nature, and who are profoundly convinced that permanent national welfare depends far more intimately on the condition of the darkest, than on that of the brightest group of the members of the community, in a word, by special effort to bind the operative class to the common weal by the strong tie of sensible benefit, great peril and great disaster can alone be avoided for the future. If the lessons taught by the events of the past decade do not induce us to set our own house in order, our children may have to write—*Anglia fuit.*

On the part we have ourselves played, in our small but earnest way, during the past year, we will say nothing here. *Scripta manet.* What is writ is writ. But we will venture to add a dozen lines as to the future. After an experience extending over more than a quarter of a century, our readers will need no fresh promises, but they may be willing to hear that no endeavours will be wanting on our part to obtain for the arts of architecture and construction the widest appreciation, to extend the usefulness and comprehensiveness of the *Builder*, and to attain increased excellence in its various departments of literature, science, and art. We are not ashamed to point to the past as evidence for the future; and upon that past we raise our scaffold for further advance. Apart from our narrower professional and business purpose, we have ever been animated with an earnest desire to advance the general welfare, to induce regard for honesty and truthfulness, to spread abroad a love of art, to increase the means of wholesome enjoyment, to improve the homes of the people, and to lengthen life by implanting sanitary knowledge. This desire continues to animate and prompt us; and to the extent to which it may be successful we shall consider, when the race is run, that we have not striven in vain.

GEORGE GODWIN.

ARCHITECTURAL SKETCHING.

We offered the other day to our readers some considerations with regard to architectural drawings, their right use and employment, and the various methods of execution employed in producing them. A few words as to architectural sketching will perhaps be accepted, by our younger readers especially, as a not unappropriate sequel to our former remarks.

Young students of architecture are constantly exhorted to lose no opportunity of sketching; a recommendation which is generally, almost universally, taken to signify that they should visit as many monuments of ancient, especially Mediæval architecture, as possible, and fill their sketch-books with details from those buildings, or remains of buildings, or occasionally with views embracing the whole of a structure. We have no special quarrel with this general reading of the precept; in the main, it is certain that most buildings in Europe of the Mediæval period are better worth sketching than most modern ones, or than any others, perhaps, except the Greek remains of architectural art, which are, unfortunately, beyond very easy reach for most students. There is a double interest, too, in an old building, arising from its historical associations, and from the fact that in many instances it is a monument in a precarious state of existence, *cito perituram*, and of which, therefore, some memorial is the more to be desired. But it would perhaps be as well if the objects of architectural sketching, and the *modus operandi* to be preferred, were a little more definitely indicated than they sometimes are. Indeed, doctors differ so much on this point, that learners may well be a little puzzled. One recommends rapid and rough, what is called "effective" sketching, which is often very idle work; and however effective it may seem to amateurs, only shows to the professional eye that its author has shirked the task of getting correctly the precise outline and proportions of the feature sketched, as well as the mechanical trouble of making clean and precise lines. This kind of rough-and-ready sketching is of no use whatever to the student, as the sketch is no faithful representation of anything, and the process of producing it has only assisted to confirm him in a slovenly habit of using the pencil. A counter heresy set up a little time since by a small knot of young architects was, that as the only object of sketching is to collect materials (which is certainly a very honest way of putting it), therefore there was nothing like a small photographic apparatus, which would secure you any number of details twenty times as fast as you could sketch them, and much more correctly, besides saving an immense amount of time. We do not believe the theory gained many supporters; and if it were worth refuting, what we have to say a little further on would be sufficient refutation. In contradistinction again to this, the oracular advice was uttered by a talented architect, in lecturing to some of his junior brethren "measure much, sketch little, and keep your fingers out of chemicals"; a comprehensive dogma involving of course, the condemnation, more or less, of all sketching by eye, and the substitution of measured memoranda (rather than sketches) to be drawn out afterwards. Such contradictory opinions on the subject indicate, at least, that there are various ways of looking at architectural sketches; and that they have quite a different kind of value in regard to the special object with which they are made.

Now, there are three different objects which may be aimed at in architectural sketching: the practice of the hand and eye in perspective drawing, and in acquiring the power of rapidly and correctly representing on paper any architectural feature which it is desired so to illustrate; the education of the mind with regard to the process of architectural design, as exhibited and preserved in the greatest monuments of the art; or, thirdly, the mere collection and recording of facts and forms for illustrative or archæological purposes. Now, for the first-mentioned end, the practice of drawing from existing objects is of the greatest importance to the young student, as it gives him a power over the art of perspective sketching which nothing else can so well give; and for this it is manifest that only the habit of drawing and estimating proportion truly by the eye, without any assistance from measurement, will tend towards the desired result, and confer at once the power of representing original conceptions on paper, and of forming, in so doing, a ready estimate as to the relation between actual proportion in a design and the apparent proportions assumed by the same design when foreshortened in perspective. And for this purpose the nature of the buildings copied is of less consequence than in other cases. It is, no doubt, much pleasanter to sketch from fine specimens of architecture than from mere commonplace buildings; but if the former are not at hand, almost equally good practice, so far as mere power of drawing is concerned, may be made in copying any objects which offer something for perspective to do in producing a correct representation of them. The second object, that of gaining a knowledge of, and catching the spirit of, the finest and most picturesque styles of architecture, of course pre-supposes that the student has first placed himself within reach of what is really worth sketching with this object. And when tours or expeditions are planned for this purpose, it is well to select a district marked by its own architectural character and peculiarities, which will thus be more readily grasped than when the student wanders, without rule, from one district, and from one class of building, to another; and it is not unimportant to mark such peculiarities of different neighbourhoods, and study them conjointly, since any features that are found to characterise the buildings of a special locality will almost always owe their existence to something in the materials, the climate, or the popular customs of the locality, which has, directly or indirectly, influenced the architectural character of its buildings; and by studying such local variations of type *en masse* we often get interesting and valuable hints, capable of being further expanded, as to the relation of design to material and to extraneous circumstances. The pursuit of sketching, with the object of self-education, may well include both sketching by eye and measuring. The former method will best train the eye in the characteristics and peculiar feeling of the style studied; the latter,—viz., the making of measured sketches just sufficiently detailed to be drawn out afterwards,—will serve the double purpose of self-instruction as to the method by which the effect of the building, or ornamental feature is produced, and the history (so to speak) of its design, and of a record of this for future reference, when required. We should not recommend either method to be pursued to the exclusion of the other; for, while, on the one hand, there is no doubt that any one who has measured and drawn out an architectural feature correctly to scale, and with details and sections of mouldings, knows more about its construction and intention than any sketch of the eye only, however careful, will give him; on the other hand, a sketch carefully made on the spot, and with the object before the eye, will often give more of the real spirit and appearance of the feature sketched than a drawing finished afterwards at home, from however accurate measurements; especially in regard to the effect of light and shadow, which is too important a matter to be entrusted to memory. But no one with the true feeling of an architect will omit, in making a sketch by the eye, to copy also, even if but roughly, the sections of the various parts and mouldings, &c., since these are the framework of all architectural design, and an architectural sketch without such indications is worth little or nothing for reference. When, however, the student is compelled to pass hastily over an interesting building, where there is no time for careful sketching, valuable details may often be secured in a very short space of time, by correct indication of the leading lines and proportions of the feature sketched, accompanied by one or two measurements and sections which can be sufficiently got by means of a 2-ft. rule. But, under favourable circumstances, we believe that making careful sketches on the spot, with the building before him, is the best practice for the young sketcher, and ensures, moreover, a complete representation of the architectural effect of what is sketched; while it sometimes happens that measured memoranda, taken with the intention of drawing them out afterwards, never get completed at all, other engagements intervening, and the completion of such sketches being deferred, as work that can be done at any time, until the interest in, and recollection of, the original has nearly faded from the memory; and when the draughtsman does bethink himself of drawing them out, he may find that he is fain to draw a little on his imagination also, for measured skeletons of sketches can seldom be safely completed unless the general aspect of the original object is pretty fresh in the memory: every architect's pupil who has measured a building for additions and alterations knows this. As to drawings made for the purpose of preparing illustrations for publication, or as a basis for archæological research, these, of course, must include, in the full extent, all that careful sketching and accurate measurement combined can effect; but this kind of work scarcely comes under the head of what is generally understood by sketching, and is never entrusted, or never should be, but to experienced hands.

As to the mode of sketching, and the materials and medium to be used, tastes and habits are of course very various, and the style of manipulation which will suit one sketcher will often be irksome and unsatisfactory to another of equal but different ability. A consideration of the peculiar object of the sketcher ought, however, to govern his choice of material to some extent. Distinctness and precision of line is one of the first desiderata in architectural sketching, and this at once points to the employment of paper with a comparatively smooth surface, especially if pencil is used; the granulated surface of such paper as is usually made into "block" sketchbooks will continually wear down the point of the pencil and necessitate constant waste of time in cutting it, besides increasing the difficulty of producing a firm, definite outline. The sketchbooks filled with tinted paper with tones of drab and grey, &c., are perhaps abo[illegible]

the best to use for pencil sketching; the paper, however, does not bear the use of india-rubber very well. We have seen very good and effective sketches made in an ordinary "indelible" note-book, the strong lines and shadows done with a common drawing-pencil, and the more delicate shading, to indicate contour of surface, put on with the metallic pencil; this gives a very pretty and delicate finish, and is very durable. The best working pencil for the sketcher, if he use, as we recommend, rather a smooth paper, is one of about the quality of those lettered "H. B.," by Messrs. Winsor & Newton, which can be made equally available for outline and shading. But though a pencil is the most ready, convenient, and portable sketching tool that can be carried about with one, and offers great advantages from the equal facility with which it works in every direction, there are certain advantages also in the use of pen and ink not to be overlooked. In the first place, the sketch thus executed is at once indelibly fixed; whereas pencil always becomes more or less obliterated in time, and it is often found necessary to put a pencil sketch in with ink afterwards, to preserve it. The character of the masonry or woodwork of a building, again, can be better given with the fine strokes of a pen than with any pencil; and the practice of working with a material which cannot readily be obliterated is most advantageous to a young sketcher, as it obliges him to draw with consideration and to know fully what he is going to do with a line before he draws it. Of course, in sketching with a pen, it is necessary, for anything but small details, to observe carefully the general proportions of the object first, and dot in lightly the principal points as a guide to the eye in putting in the lines; and this also is an excellent discipline to the eye. As to the medium to be used, there are various nostrums more or less suitable: Indian ink, of course, is the best known to architects, and very good sketches may be made therewith; but it is somewhat too cold in tone to be pleasant to the eye. A slightly warmer material is that known as British ink, sold in cakes like other water-colours, and which can be rubbed up and carried in a bottle for use. It works very freely and pleasantly, and has the recommendation also, that if any serious mistake is made, a damp sponge will take the lines out much more easily than would be the case with Indian ink. Then there is the fluid sold in bottles under the title of "Prout's brown," a warm, indeed rather heated, brown, which imparts, however, a very good tone to a sketch lined in with it; but it should be diluted with nearly an equal quantity of water, for the mixture, as sold, is too thick for free use, and has a tendency to clog the pen. One of the best pens for sketching is the white steel pen made by Perry & Co., under the title of the "Classical" pen: the sort marked F being the most serviceable. With these, which are not too sharp in the point, a fine yet firm line can be obtained, while they work very easily and pleasantly over the paper. Let the student, when sketching, above all things guard against the tendency fostered sometimes by the idea that a "sketch" is necessarily something rough and hasty, to put in his lines in a dashing, hap-hazard manner, and then amend them by "painting" them over again in thicker strokes. This is a very vicious habit that young draughtsmen often fall into, and which, once acquired, it is very difficult to eradicate. Every line should be drawn clearly and sharply, as if the draughtsman were quite decided what he meant to do, not as if he were trying to get at it by a happy chance. When a long straight line has to be drawn, the best process is to draw it in sections, as much as can be done at a stroke without changing the position of the hand; it will better be got strictly vertical in this way than by moving the hand down the page, which is almost certain to result in an unsteady line; and the slight breaks left in the lines may often be made very effective in giving the jointed character of the masonry. As to using a ruler in sketching, there is nothing radically immoral in doing so, as some architects seem to think; it may in some cases produce the desired result with less time and trouble; but a parallel ruler, however small, cannot be used very well except on a rather large book or sketching-block, and is very much in the way in pen-sketching. The disadvantage of using a ruler is that those who use it get into the habit of trusting to it, and find themselves somewhat helpless when they unexpectedly wish to make a sketch without the accustomed aid; and we suspect that most practised sketchers will bear us out in the remark that, with the hand once properly trained, a ruler on the sketch-book is rather a nuisance than a help. In a general way, larger sketch-books are to be recommended than are commonly used by architectural sketchers; a little book that can be always carried about is very well as a preparation for all emergencies, but those who are setting out to sketch "of malice aforethought" (as the lawyers have it), will do well to give themselves plenty of paper to expatiate upon; and a large-sized sketch is much more favourable to accuracy of detail. Let the sketcher not be too much bitten with a desire for dainty ornamental detail, but make a habit also of sketching entire buildings, observing carefully their proportion and composition, and noting specially any happy effect produced purely by the balance and contrast of line, independently of ornament; for these are the most durable sources of architectural effect, and the most difficult to originate successfully. A sketch of a single group of building will often suggest a great deal in architectural composition, beyond what actually meets the eye. Let the sketcher also never omit to give in his sketches careful indications of the character and jointing of the masonry or other material, and the way it is put together, upon which a great deal of the expression of every really architectural building depends; and in getting sections of mouldings, always mark in what part of the moulding the jointing occurs; get, in fact, the construction of the feature sketched, as well as its mere appearance. Above all, it is well to trust nothing to memory, and not to finish up sketches afterwards from recollection (except, of course, from measurements). A great part of the value and spirit of a sketch always depends upon its having been done with the object before the eyes; a sketch so done, as far as it goes, is of far more worth than even an elaborate drawing cooked up from sketches; and it is probably to this process of cooking drawings afterwards that we must trace the curious variations in published representations of the same buildings, and the fact that in many cases, when we come for the first time to see a building previously known through some book of architectural illustrations, we find the reality so exceedingly different in its effect, and even in its outline and facts of detail, from what we have been accustomed to accept as an authorised and authentic representation.

One word as to the use to be made of an architect's sketches. Probably no practice is more pernicious, or has done more to promote odd vagaries and discrepancies of architectural design among us, than that of using a book full of sketches as a reservoir to draw upon for new buildings. Some of our readers may remember how, on one occasion, a well-known architect, exhorting his professional brethren as to the desirability of spending a part of every year in sketching, in order to gain new ideas in composition, added the solemn injunction, never to look at the sketches afterwards, but rather to burn them; and how an old member of the Institute seized the opportunity for an adroit compliment, suggesting that, "if Mr. ——, instead of burning his sketches, would make him a present of them, he might rest assured he should never see them again." We should say, preserve carefully every sketch you make; but the advice not to look at them too much afterwards is perfectly reasonable. It is not thus that the real advantage of a sketching tour is reaped. It may often be useful to refer to a sketch to refresh the memory as to facts, as well as to judge where the weak points of execution are, and how they may be improved upon in future. But the real gain from a series of sketches, carefully and intelligently made, lies in the additional practice given to the hand, and in the numberless suggestions as to effect, construction, grouping, ornament, which remain in the mind afterwards; and these are far more likely to be well and usefully amplified into new ideas in architectural treatment, if what they suggest is thought over again, and designed anew, as it were, by the architect, than if he deliberately sit down, sketch-book before him, and drag into his own buildings, wantonly and without purpose, the details "bagged" during an omnivorous sketching tour, from the works of his predecessors of another age or country.

Works of the Old Masters.—The Exhibition at Burlington House will be opened to the public on Monday next.

COMPLETION OF THE MONT CENIS TUNNEL.

The completion of the Mont Cenis Tunnel is a great triumph of engineering art. It is the longest tunnel, in so far as we know, that has been driven from the opposite ends, with the two borings meeting with precision. We have not before us the full particulars of the meeting of the two approaches, but may expect to have them on an early day. Meantime, it may be interesting to recall some of the principal facts in connexion with this work. In 1852, a plan for a tunnel to connect Savoy and Piedmont was proposed by Chevalier Maus. This plan fell to the ground; and in 1856 another was projected by MM. Grandis, Grattoni, and Sommeiller. This is, in its main features, the scheme that has been carried out. It was determined that the line should not follow the route of the Great Napoleon road across the Alps, but to save distance by a cut to the south-west. Near Modane, or rather at Fourneaux, a hamlet on the banks of the Arc, on the Savoy side of the Alps, the tunnel was to be begun; and on the Italian side at Bardonnèche, about twenty miles from Susa, from which there is railway communication with Turin, the Italian peninsula, and the eastern railway of Europe. The one village is 3,445 ft. above the level of the sea, and the other 4,225 ft.; so that there had to be an ascent of 780 ft. to be encountered. It was determined to lay out the tunnel in two inclines, each descending from a summit level, but with a sharper descent on the northern than on the southern side. From the great height of superincumbent matter over the tunnel, it was impossible to sink shafts according to the ordinary mode, so that the ventilation had to be effected from the two ends of the tunnel. The boring-machines were put to work in 1861. The tunnel is over 13,000 yards, or about 7½ miles in length, and is 26 ft. 3 in. wide, by 19 ft. 9 in. high, which affords space for two lines of rails. The excavations were for nearly two-thirds of the distance through schist, the remainder being through limestone and very hard quartz, which caused great trouble, and occupied a comparatively long period, particularly during the latter portion of the time employed. The perforating machinery was skilfully contrived, and very beautiful in operation, being a combination of hydraulic and pneumatic power. Large reservoirs, considerably higher than the entrances to the tunnel collected water from the streamlets, and from rainfall on the Italian side. The water was sent down to a lower level by large iron pipes, supplying, in the descent, the power required for the boring operations,—the water pressure was equal to 26 ft. perpendicular. At Fourneaux, we have seen the beautifully contrived air-compressing machines, the aërometers and receivers. The action of the water (pumped up from the arc) upon the aërometers set the compressers to work; these compressed the air so that it exercised a pressure of 96 lb. on the square inch. The compressed air worked the excavating machines, to which it was conveyed by strong 8-in. iron pipes. The excavating machine took out a drift 12 ft. wide by 8 ft. high; the remainder of the work was executed by blasting, or hand-labour in the ordinary methods. The boring machine was mounted upon wheels, and was forwarded upon a tramway. It had ten perforators, acted upon by two flexible tubes, the one conveying compressed air, and the other water. The jumpers each made its own hole, and had a rapid to-and-fro motion, and change of angle by the action of the power applied. The jumpers only bored for blasting, and, when the rock was ready, the boring machine was withdrawn, secured behind folding doors, and the fuse was lighted. A blast of compressed air was then sent in to clear the smoke and sweeten the tunnel, and the miners proceeded to finish, with their picks, what the boring machine had so well begun for them. In ordinary limestone, the boring machine made about a yard an hour, but the progress through the quartz was much slower. The holes were bored to about 2 ft. 3 in. deep. The jumpers gave three blows per second under an impulse of about 180 lb., and turned on their axis at each blow. In boring through limestone, a jumper was equal to six or seven yards of work, but acting upon quartz, six or seven blows destroyed the points.*

* Some accounts of the works after personal examination will be found in earlier volumes of the *Builder*.

The Mont Cenis Summit Railway, with which the late lamented Mr. Thomas Brassey had a good deal to do, was a spirited enterprise that ought to have succeeded, but has not done so. The new route is exposed, both at the Savoy and Piedmont ends, to avalanches and Alpine floods, from the powerful action of which we hope it may be protected, and prove in its usefulness all that has been hoped for concerning it.

THE CHINESE SYSTEM FOR THE UTILISATION OF SEWAGE.

In discussing the very important question, what is the best system to adopt for the disposal of the sewage of our towns? we ought to be able to obtain very considerable information and assistance from other countries; but I may venture to assert there is no country in Europe where there is anything like our systems of underground sewers, together with the extensive application of water to closets, and for all other purposes connected with cleanliness. It is true that our more immediate neighbours, the French, just commenced such a system, under the auspices of the Emperor, but it is too recent an experiment for us to judge of the results. In all Germany there are but a few futile attempts to utilise the refuse of the towns.

The Hungarians have so little notion of the importance of regenerating the land with the best fertiliser within the reach of all nations, that they positively pile up near their houses the faces of their ancestors, which they regard with a sort of religious veneration.

And if we go on farther, and through all the cities both of Europe and America, we find chiefly only the old barbarous mode of cesspools and bog-holes, impregnating their wells and other water supply so much that they use the same [illegible] several times over, a system quite as much open to obloquy as the practice in Hungary. Indeed, all over three-quarters of the globe there is very little that can throw a light upon this apparently difficult and unsolvable scientific problem.

Turn we then to the remaining quarter of the world, Asia (for although we have not mentioned the poor inheritance of the sons of Ham, Africa, there we fear all is barren for our subject, since the days when the mother of arts and sciences, Egypt, was overrun by the followers of Mahomet), and here we find the elucidation.

The following statements are compiled chiefly from notes taken during a botanical tour through the central and north-western provinces of China, the botanical portion of which only has hitherto been made public. In all the works that have been written respecting this, the oldest constituted nation, and the most densely populated country on the face of the earth, alleged to contain one-third of the whole living human race, we have never met with a description of their method of collecting and disposing of the sewage of most of their cities and towns; and as it appears to us to combine all the advantages of long experience, together with the best and most salient points of every other scheme with which we are acquainted, and the working is very simple and most remunerative, we propose to give a sketch of the *modus operandi* practised by a people we are often disposed to consider as only half civilised.

The difficulty of access for Europeans to this, which has been called the Celestial Empire, must be the reason why this method has not been reported before, there having been so few scientific travellers allowed there, and these few bent only upon one or two particular subjects, and the so-called missionaries who seem to consider their mission as entirely confined to the spiritual and future state of mankind, and the exclusion of their comfort or well-being in this life.

The Chinese are unquestionably the best agriculturists of any people, every one being an excellent gardener; for they all cultivate some kind of plants or other, and their whole country, so far from being worn out or exhausted, like many of the countries of antiquity, is as productive now as it was in the days of Confucius, a few thousand years ago; and this, there is no doubt, proceeds from their system of replenishing the soil with its best and most natural pabulum.

Well may this be called also the Flowery Land, for every foot of land, rock, and even the water, sparkles with blossoms and flowers at certain seasons of the year; for a Chinaman would no more think of pouring filth into a river than he would of fetching his manure some thousand miles from the ends of the earth. Consequently their streams are generally as pure as the mountain torrent from which they take their rise.

China possesses within its boundaries every specimen of the animal, vegetable, and mineral kingdoms that is to be found in any other country, and many more peculiar to itself. It is where the natives assert our first parents were started into life, and where, indeed, there exists the appearance of all we can fancy Eden was, with everything to delight the eye and to please the taste.

It is in this favoured region, which, from the above extracts, can be no mean authority as to salubrity, that men practise the following system of disposing of their disjecta membra.

The whole of the matter which we waste and flood away they collect, either by means of open watercourses or underground drains. This is carried to some vacant space, either in the vicinity of the town or oftentimes to a considerable distance, according as the land may be obtained or may be available for irrigation, after the other operations. On being conducted into a kind of sump prepared for it, steined round with gypsum, it is then either pumped or lifted by more primitive means (such as a kind of turbine, wherein the outfall of the sewer gives the power to work the machinery for the raising, and several other simple contrivances, something like what we call the Persian wheel, and a sort of chain-pump) into two or more reservoirs, which have been formed either by digging out and throwing up the earth to form the banks, or else by other materials brought to the spot for the same purpose. After the sewage has been discharged into one of these receptacles, until it is entirely full, it is left to settle or subside; then the same process is carried on with the next, and so on to as many as the quantity of matter or size of the town requires.

By the time the last is full the water on the top of the first that was charged is let off, to irrigate either the surrounding lands, or conveyed to any distance that may be required or available.

This course is repeated to the remaining reservoirs; in the meantime the first is filled again and again, until the solid matter has collected sufficiently to require removing; then the surface water is drained off as much as possible, and in a short time the remainder is dry enough to remove away in carts and wagons: this is done by breaking down the side, or anywhere most convenient. It is then re-constructed and again made fit for use; the same to the other reservoirs in succession. The sides of these are lined with either gypsum or chalk, and where these are abundant or easily obtainable, the banks are formed of them, and great quantities are also thrown in the reservoirs during the time of filling.

These banks at first will allow of the water to ooze through; but as they are usually upon the same land which is afterwards irrigated, this is of very little consequence, and they very shortly become silted up with the substances suspended, and get eventually water-tight.

Except in exceedingly wet seasons, a very small quantity of water ever reaches the river, and when it does so, it is as pure as the stream into which it flows.

These reservoirs are of all manner of sizes and shapes, some round, some square, but are mostly oblong, about 60 yards long by about 40 yards broad; but this is entirely discretionary and immaterial as to the efficiency; the same with the depth, which varies from 12 ft. to 20 ft. It will be noticed that we have been treating of a case where it has been compelled to raise the sewage; but where the fall of the land is such as not to require any lifting, there is often a continuous line of these receivers, and on many lands these have certainly been in existence for ages. Then, in other instances, they are moved about on the same estate; but the same principle is carried out in each.

The smell from these works is scarcely perceptible, which may be attributed to the absorption of the ammonia by the gypsum and chalk, of which great quantities are drawn away and spread upon the land; also all kinds of ashes are brought to the neighbourhood and incorporated with the other matters in these receivers.

The expense and management of these systems are generally undertaken by the owner of the land which is treated with the manure, and for which payment is made to the authorities of the town; but in many instances they are conducted by the town functionaries themselves, and the produce sold. In large towns it is not all conveyed to one locality, but often in opposite directions, or wherever it will command the highest price.

Having thus endeavoured briefly to describe the system pursued for this desirable object by the most ancient nation in the world, we may next inquire whether this plan is not capable of being adapted to the requirements of our Legislature? And is it not wise to insist upon some such method being enforced in this country?

Are there not quantities of land lying almost waste from the poorness of the soil in the vicinity of nearly every town in the kingdom? Look at the tracts round London. Why does that barren waste, called Barnes-common, on the South-Western Railway, remain in its present uncouth condition? The same with all the other commons? And many parts of the country have wastes far more desirable for our purpose than these instances; but they all require a better soil, a more fertilizing power. Many are gravelly, or sandy, which are just the geological materials required for our purpose; but, at any rate, all would make the best deodorizer that can be found, if the sewage water were made to trickle over it after the grosser portions had been deposited in reservoirs.

Then, again, is it not monstrous that nearly all this precious commodity that is collected from the largest metropolis in the world should be absolutely poured away into one of the finest rivers in the world, either killing or deterring the fish from entering it, and often flowing back to the spot it originally started from, poisoning the inhabitants with its pestilential odours, breeding typhus fever and all the other ills that flesh is heir to, from the defalcations of our ancestors through not attending to this matter, and utilising these substances which nature seems to force us to do, or neglect at our peril?

The circumstance that the drainage of every place is conducted to one particular point or line, which is usually the bank of the nearest stream, renders the construction of an intercepting sewer along its sides a plain way of carrying off the proceeds to wherever it may be decided to convert it into not only the finest fertilising agent in existence, but the most remunerative production for the outlay.

GEORGE BURCHETT.

INSTITUTE OF PAINTERS IN WATER-COLOURS.

It is of very little use saying, with such weather as this, that a number of very agreeable sketches, studies, and pictures, will be found as a Winter Exhibition in the galleries of the Institute of Painters in Water-Colours. Locomotion is difficult, and light insufficient, to say nothing of the apathetic frame of mind cold dark weather brings. No wonder that nothing great comes from the frigid or the torrid zone. What poor creatures of climate, circumstances, parentage, and education we are!

Nevertheless, if a gleam of light be taken advantage of, the landscapes of Mr. Bennett, Mr. Mole, Mr. Hine, Mr. Jas. Fahey, Mr. Mogford, Mr. H. Pidgeon, Mr. Skinner Prout, Mr. Collier, and several others will be found enjoyable, and, if one could handle fire by thinking of the frosty Caucasus, would serve to restore those delights which the season denies. Works by Mr. Bromley and Mr. Small should not be overlooked. Mr. H. Tidey sends some clever landscapes in lieu of his usual figure-subjects; and Mr. B. R. Green continues his series of accurate representations of ancient buildings in England, which, if kept intact, must be by this time of considerable extent and value.

"LIGHT AND DARKNESS."

The flood of typographical novelties of all kinds which Christmas-tide always brings, suggests to some thousands of persons, the members of the Art-Union of London, to inquire what form the annual work of that institution is to assume for the current year.

We have just received an impression of the plate for 1871, a large and important subject, with the above title, from the burin of Mr. W. Ridgway, after the original by Mr. Geo. Smith. The subject is of a rather more domestic character than those hitherto produced by the Society. It is a kind of pictured sermon—a sort of compound of Hogarth and Wilkie. A blind girl is seated, holding in her lap a Bible, printed in that raised type which confers so great a blessing on those who are deprived of sight, and

from this, by the aid of her rapidly tracing fingers, she is pouring out to a listening company of cottagers words of warning, of reproof, of hope, of consolation, "to give light to those that sit in darkness."

The wrapt attention of the children, and the awakening interest of the father of the family, who *sits* in the midst, regardless of his extinguished pipe, are well expressed; but the chief point of the story centres in the struggle evidently going on in the mind of the younger man in the left-hand corner, who is divided between an inclination to remain and profit by the words of the reader, and a disposition to accompany a boon-companion to the fair, the distant tents of which are seen through the open window.

The figure of the tempter is judiciously kept somewhat in the background; and though he is no doubt rather elevated, and reminds us a little of one of the figures in Mulready's "Fair-time," we are not so disagreeably impressed as by that picture. To second the influence of the reader, a buxom lass, evidently the eldest daughter of the family, looks up appealingly in her brother's face, and touches his arm with persuasive action, while his wife, holding the baby in her arms, anxiously watches the struggle. Let us hope that "light" will prevail, and mingle with "sweetness" in an evening of domestic happiness. It must be allowed that the story is plainly told, and this is an important element in the fitness of a work of art which is intended to interest and elevate large numbers. It is full of suggestion, and not without pictorial beauty, and we have no doubt it will be popular with the subscribers, and will carry its lesson to every quarter of the globe.

CAUDEBEC LADY CHAPEL.

I THINK I can afford your correspondent, Mr. J. B. Cohen, some indisputable information respecting the construction of the great pendant of this chapel which may set his doubts at rest. I, with Mr. Talbot Bury, and others of Mr. Augustus Pugin's pupils, many years ago accompanied that gentleman, and assisted him by sketching and measuring the various portions of buildings published by him in his work, entitled "Specimens of the Architectural Antiquities of Normandy."

I have a most vivid recollection of the intense interest which the elder Pugin felt in the construction of the remarkable pendant of this chapel. I can answer for it, that there is nothing in his illustration of it as shown in Plate 64 but what is perfectly correct. An opening being made through the tuffa of the groining at the top, some of us got in, and no little trouble was it to get out again; but, with a light, there was no difficulty in ascertaining the sizes of the voussoirs resting upon the huge key-stone of the groining, a monolith of upwards of 17 ft. long. There may probably be some conjecture as to the sizes of the voussoirs built into the external angular buttresses, but in all probability they would correspond with those visible to the eye.

The striking feature, however, of the lady chapel, both in execution and effect, is this surprising pendant: its appearance looks quite perilous, and until Pugin, with his wonted energy, had a hole made, and found out the exact nature of the construction, all sorts of notions were prevalent, many believing that iron suspension-rods, &c., were employed.

A careful description of the construction ought to have accompanied the plan and sections. Britton, who never even saw this chapel, or any of the buildings he describes, could only give meagre accounts, wholly insufficient to exhaust the constructional interest which attaches to them. This was through no fault, but an unexpected illness which prevented his accompanying Pugin. BENJ. FERREY, F.S.A.

THE SANCHI TOPE: AGE OF INDIAN BUILDINGS.

THE answer of your correspondent "Asiatic" to my letter regarding the date of the Sanchi Tope is more ingenious than ingenuous. The public were not invited to inspect a cast of the Tope itself, whatever its date may be, but a cast of one of its gateways, which, it is now acknowledged, was erected in the first century after Christ.

Supposing the object exhibited had been a cast of the screen recently erected, under Mr. Scott's auspices, in Ely Cathedral, would it have been correct to describe it as a cast of the reredos in Ely Cathedral, erected between the years 1082 and 1342 A.D.? So far as I understand the English language, such a statement would have been incorrect, and decidedly misleading.

At a proper time and place I shall be quite prepared to discuss with General Cunningham the question whether his date or mine is the most probable for the age of the Tope itself. Indeed, I am anxious to take up this among other questions of a like nature, as I perceive that Lieut. Cole, improving on an early work of the General's, has recently published a work on Kashmir, in which he has affixed erroneous dates to almost every building he describes, and in several instances to the extent of 1,000 years and more. It is this that makes me nervously sensitive regarding the dates of Indian buildings as propounded by the Science and Art Department; for I feel that unless some one protests in time, they will pass as accepted facts into popular belief, and all that has been gained by the study of Indian archæology during the last thirty or forty years may be thrown back into its primitive confusion. JAS. FERGUSSON.

A CREWKERNE HOLLA!

WE find the following remarks in the *Crewkerne Weekly News*:—

"The advantage of going from home to hear home news, and be informed about home matters, is exemplified in the *Builder*, which has lately taken upon itself the abuse of country towns and their belongings. Lately Glastonbury was impudently lectured. Now the lash descends upon Yeovil. The town council never can survive. The town itself will collapse, as sure as fate, unless the *Builder* condescends to be merciful. The Board of Guardians will open wide their eyes on reading their own vileness, and we have only space this week to extract what is written thereon, reserving other matters, from the fear of the awful effects of the whole dose being administered at once."

What the Crewkerne critic or his worthy Yeovil coadjutor means by speaking of our "abuse of country towns," or "impudently" lecturing, we do not pretend to know, as we are conscious that the *Builder* has never yet stooped to Billingsgate, however great the cause of indignation. Instead of expressing their obligations to us for pointing out, with an imperative pen, sore sanitary needs and phases of frightful social neglect and moral degradation, more than one of the Devon, Dorset, or Somerset journals have met our stubborn facts in a similar fashion to the above. This last Crewkerne shout is rather ill-timed, as we have not yet touched upon that town internally, the outlying ulcers alone having been probed. If the Yeovil magnates are able to impugn our statements, the sooner they do so the better. We deal with localities upon their merits, and if Crewkerne should come in for passing notice, we pledge our word that the lecture we will present, sanitary, social, and otherwise, will be a "striking likeness."

ST. JUDE'S CHURCH, SOUTH KENSINGTON.

ON the 23rd inst. this church was consecrated by the Lord Bishop of London. At page 547 of our present volume will be found an exterior view and a brief description of the building. The management of the double transepts there described has the desired effect of bringing a considerably larger proportion of the congregation near to the pulpit and reading-desk than would have been the case had the nave been extended.* The ventilation is aided by Moon's louvre ventilators, fitted into three openings at the east and the same number at the west end, as well as by the ordinary swing and hopper ventilators in the windows.

The east and a portion of the side walls of the chancel are lined with encaustic and majolica tiles. Above the altar-table three panels are introduced in mosaic, the centre containing the monogram I. H. S., with the Alpha and the Omega on either side. The flooring is also laid with encaustic tiles; the whole by Messrs. Minton. A fine window at the east end, the gift of Captain Gunter, on whose estate the church stands, has been executed by Messrs. Clayton & Bell. Another benefaction to the church in the shape of a large organ, has been made by Mrs. Powell.

The gasfittings, including a corona in the chancel, were supplied by Mr. Shrivell. Messrs. Cox have executed the pulpit, prayer-desk, and font (a separate provision), from the designs of the architects. The stone carving generally was done by Messrs. Herley & Abbey.

The church, exclusive of the tower, has been erected to meet particular circumstances, in about nine months, the contract having been signed only on the 25th of March last; and, considering the accommodation is for 1,000 persons, and includes a large lecture-room below capable of holding between 300 and 400 persons, with retiring-rooms, and so forth, attached, Messrs. Myers & Sons, who were the contractors, deserve some praise for the satisfactory manner in which they have carried out the works, and have brought to bear the appliances of their large establishment. Mention is merited by the two foremen of their firm engaged on the building, one at the commencement, the other towards the close,—Mr. H. Sills and Mr. D. Sargeant. Messrs. George & Henry Godwin were the architects.

* We will give the plan of the church and a view of the interior hereafter.

METROPOLITAN WATER SUPPLY.

ABORTIVE attempts have been recently made to provide, by legislative enactment, a better supply of the prime necessaries of gas and water for the inhabitants of the metropolis. It is to be hoped that the Board of Trade may succeed in carrying the Water Bill that they are to present to Parliament in the coming session. The new Bill will require the companies to afford a constant supply, and will oblige owners and occupiers of houses to provide proper cisterns, stop-cocks, taps, and other appliances, to prevent an undue waste and fouling of water, and to take water at a price to be fixed in the Bill. In this Bill there will be provisions for regulating and improving the quality of the water to be supplied; for altering and reducing the companies' charges, and for other purposes, including a limitation of dividends, and to repeal power to apply surplus profits in augmentation of previously declared dividends. The Bill contemplates the amalgamation of all, or some of the existing water companies, or, if need be, to dissolve some of them, and incorporate a new company, or companies, in their place. The Bill includes powers for the Metropolitan Board of Works, the Sewers Commission of the City of London, or the Corporation, jointly or separately, or other bodies, to purchase compulsorily, or by agreement, the property of the water companies, and to enter into contracts with them, or with other companies or persons, for supplying the metropolis with water. The Bill is, in short, to give all necessary powers for affording a better and cheaper water supply. This recommendation of constant supply is not new. It is discreditable to the metropolis that it should lag so far behind many of the second- and third-rate towns in the kingdom.

THE INSTITUTION OF CIVIL ENGINEERS, GENERAL MEETING.

ON the 20th inst., Mr. Hawksley, V.P., in the chair, the fifty-third annual general meeting was held. The report stated that during the past session there had been a net effective increase of 44 members, 70 associates, and 35 students. There were on the books on the 30th of November last, 16 honorary members, 699 members, 988 associates, and 173 students, together amounting to 1876, as against 930 ten years ago.

The nominal or par values of the funds under the charge of the Institution were,—1. General funds, 10,656*l.* 1s. 8d.; 2. Trust funds, 12,119*l.* 15s. 8d.; and 3. Cash balance, 369*l.* 17s. 5d., together amounting to 23,145*l.* 14s. 9d., as against 19,775*l.* 17s. 4d. at the date of the last report. Of these funds a sum of 10,163*l.* 17s. 4d. was invested in Government stocks, and the remainder, for the most part, in 4 per cent. debenture stock of some of the leading railway companies.

The abstract of the receipts and payments for the past year, as certified by the auditors, showed that on the 1st of December, 1869 there was a balance in the hands of the treasurer of 268*l.* 9s. 6d., and there had been received since (including the Appold bequests of 1,800*l.*) 9,653*l.* 10s., making together 9,921*l.* 19s. 9d. The disbursements had amounted to 6,583*l.* 6s. 10d., while 2,968*l.* 15s. 6d. had been invested, leaving a balance of 369*l.* 17s. 5d. Although a larger sum than usual had been expended in publications, yet out of the ordinary revenue

...doo-Mahomedo... ...th of India; ... ...meaningless... ...neral effec... ...k rod of... ...t of present cash balance exceeded the former one by 101l. 7s. 8d.

The following gentlemen were elected to fill the several offices in the Council for the ensuing year:—Charles Blacker Vignoles, President; Thomas Hawksley, Joseph Cubitt, Thomas Elliot Harrison, and George Willoughby Hemans, Vice-Presidents; John Murray, George Robert Stephenson, Nathaniel Beardmore, William Henry Barlow, James Abernethy, John Frederic Bateman, James Brunlees, Joseph William Bazalgette, Frederick Joseph Bramwell, and Edward Woods, Members; and James Joseph Allport and Major William Palliser, C.B., Associates.

FLORENCE.

Wonderful changes have been taking place in Florence during the last four years. The handsome boulevards are being built; the roads of some already made; the streets well paved, well lighted; public conveyances are excellent; the draining is improved; and streets are widened. The Florentines like to finish one thing at a time, so that many needful improvements are waiting to be carried out. It is to be hoped this change may not deter the companies from continuing the improvements begun.

Fraleini, the eminent sculptor in wood, has just finished two exquisite wardrobes for the Marquis of Westminster. Foliage, flowers, fruit, birds, cover the whole surface on a *gold* ground, producing a very rich effect. The elegance of the designs and great finish of this artist are unsurpassed.

THE NEW MARKET HALL, NEWTOWN, MONTGOMERYSHIRE.

This new market-hall has been opened. The entire length of the market is 180 ft., by an internal width of 50 ft., the walls being 19 ft. from floor to wall-plate, and 28 ft. to the ridge.

The east and west sides of the market are fitted up with commodious shops for different trades; two large rooms, 20 ft. square each, for the sale of grain by sample and in sacks, being provided at the High-street end. Standings for the sale of fruit and vegetables are also arranged towards High-street in the centre of the market, the remaining space being devoted to the sale of butter, eggs, and other like produce in baskets. A refreshment-room for the accommodation of those attending the market, with a dwelling-house attached, for the market superintendent is arranged towards Horsemarket-street, on an angle of land forming the roadway to the Sun Inn.

The roof, which is of iron and glass, and broken into two spans, is supported by girders divided into two bays the entire length of the market, resting upon iron columns, the roof and columns being decorated in colours. The elevations towards High-street and Horsemarket-street are executed in "Edward's light yellow patent brick," with terra-cotta decorations, the style being Lombardic. The front towards High-street contains a pediment for a clock, flanked on either side by a balustrade, with small shafts, and enriched caps and bases.

The contractors employed were:—For the general building, Mr. Evan Williams, of Llanidloes; ironwork for roof, &c., Messrs. Howarth, Rochdale; and for market fittings, Messrs. Black & Readdie, of Liverpool. The entire building (which is the largest for market purposes in the principality) being erected from the plans and under the superintendence of Mr. David Walker, of Liverpool and London.

TAUNTON IMPROVEMENTS.

The North Town Bridge is to be widened early in the new year. It is narrow and inconvenient, and totally insufficient for the amount of traffic by which it is burdened. It is thought that between 300*l.* and 400*l.* will be about the sum required for its improvement. This amount will be hardly sufficient to allow for more than a very plain and unornamental alteration. The county is expected to contribute about half, it being a county bridge. A memorial, with plan and estimates, will be presented at next Quarter Sessions. The Turnpike Trusts will agree to give 100*l.* towards the alteration.

Last summer we called attention to the defective drainage of the town, and the very bad state of the river Tone, which is little less than an elongated cesspool for a considerable distance. A good opportunity now presents itself to the townspeople and the Local Board of Health to carry out a double improvement by the purification of the river and the utilisation of the town sewage. We lately passed through both wings of the Taunton Union; men's, women's, and the sick and infirm wards, and in justice we must say that everything we examined therein on the day of our visit was fairly satisfactory; and, unlike some other Somerset workhouses, cleanliness and comfort were observable.

YEOVIL COTTAGE HOSPITAL COMPETITION.

The report of the sub-committee appointed to select a design for the Cottage Hospital was approved by the general committee on Thursday, 22nd. The motto of the design chosen out of twenty-eight sent in is "Well Considered," the author being Mr. J. Johnson, of London. The ground plan shows men's ward for six beds, and an accident ward for four beds, with bath-room ward, scullery, lavatories, &c., adjoining. Near the entrance is the matron's room, with small window for overlooking the ward. The out-patients' waiting-room, medical officer's examination-room, and the dispensary, are on the Ilchester road side of the site; and on the Preston road side is a small dining-room, kitchen, scullery, store, closets, pantry, wash-house, laundry, coal-shed, &c.

On the first floor are wards containing the same number of beds as those on ground floor, the nurse's room being over the matron's; a servants' bedroom, and clean linen and clothes stores are also provided.

ARCHITECTURE AND GARDENING.

That architecture and gardening were allied from the earliest times none can doubt who are conversant with the course of history. Even Scripture furnishes evidence of the fact, in the case of Solomon, and the early Eastern nations which flourished are not scant of material wherewith to supply us with examples. Among the Persians, the Babylonians, the Greeks, and the Romans, we have the authority of many writers, whose works are still in existence, to prove that gardening on a large scale was associated with architecture in embellishment, and to add grace and beauty to their massive and magnificent buildings. In the early Christian period we have sufficient examples of the same, and also in the Middle Ages.

Venantius Fortunatus, a bishop in the sixth century, writes to his mother and sister that he sends them some chestnuts in a basket woven by his own hands, and also some wild plums, which he gathered in the forest. Now this was a present which it may be said that one savage might send to another. Yet this bishop author was a man of rank, and a resident in the court of the French kings. But, again, our author celebrates the perfection of the garden of Ultrogote, wife of Childebert, king of Paris. "One sees in it," says our author, "the fields enamelled with flowers, with roses, vines, and fruit-trees. These trees were planted by the monarch himself, and the hand that planted them, no doubt, added to the excellence of the fruit."

Charlemagne's capitulars, with all his splendour and magnificence, show us what little progress gardening had made in the ninth century. He had large orchards, with kitchen gardens in which were flowers. Here is a list of them. The plants were mostly medicinal, and included marsh-mallows, savin, rue, dittary, coloquintida, squills, &c.; or aromatic, such as anis, caraway, sage, fennel, mint, &c.; or for salad, as cresses, endive, lettuce; or for the kitchen, as beet, leeks, carrots, cabbage, &c.; or legumes, as peas, beans, kidney beans, &c. The flowers consisted of the simple lilies, poppies, roses, rosemary, southernwood, stavesacre, flower-de-luce, and turnsol. The fruits were the service apple, filberts, almonds, medlars, walnuts, figs, chestnuts, pears, peaches, plums, and wall fruit. The above detail is worth recording, but we have been unable to find anything like it in this country for some centuries later.

On the continent of Europe gardening, however, did not assume much importance until the fifteenth or sixteenth century. An impulse was given to it in Italy by the Medici family, and after that time it became more prominently associated with architecture. With slight success, the British, French, and Dutch cultivated the art down to the seventeenth century, and from this date may be reckoned the uprise of successful gardening in connexion with architecture on the Continent and in Great Britain and Ireland.

Speaking of gardening in this respect, Lord Bacon remarks, "A man shall ever see that when ages grow to civility and elegance, men come to build stately sooner than to garden finely; as if gardening were the greater perfection." As far as Great Britain and Ireland are concerned, we fear the illustrious English philosopher spoke as well as prophesied the truth. In the British Isles it must be allowed that architecture advanced to its highest phase almost, while gardening remained in its cradle. In the days of Elizabeth, in England and Ireland, each monastery had an orchard in connexion with it, but, it appears by inquisitions taken in the sister kingdom during the reigns of Henry VIII. and Elizabeth, these gardens only consisted of one or two acres, devoted almost exclusively to the growth or cultivation of culinary herbs. There were certainly some indications of a vineyard in connexion with these monastic gardens. Vallancy, the antiquary, possessed an Irish almanac of the fourteenth century, in which was mentioned the season for gathering the grapes, and drinking the must (or new) wine.

A garden was attached to Cahir Castle, and, as the castle was situated on an impregnable rock, it was no doubt a protection for the garden, which was represented in the report to the Queen as capable of containing 300 men. The castles of the chieftains, their principal pride and care, were in constant danger from raids and forays of neighbouring chiefs, and under these circumstances, cultivated gardens had no chance to escape from plunder and spoliation. The Church, even, in either England or Ireland, does not appear to have taken any particular pains to facilitate the progress of improved gardening operations until a very late period in our history. In those curious codes of national justice in Ireland, called the "Brehon Laws," we find those early law-givers the Brehons, laying down certain fines, or *erics*, for the injury to the trees. The introduction of the elm into Ireland for the garniture of avenues and walks is ascribed to settlers from this country, and dates from the seventeenth century. All monastic gardens had the appendages of dove-houses and pigeon-houses, but these do not appear to have been very artistic.

Inigo Jones, Sir Christopher Wren, Campbell (Vitruvius Britannicus), Webb,—wherever these architects had to do with the designing of houses for the nobility of England, the provision for and the laying-out of gardens on a large scale were with them matters of importance and careful thought. But especially with the edifices and mansions of Jones we find that a well-planned and tastefully laid-out garden, with all its appendages, is to be found. Even where he was called in to make alterations and additions, we find him adding a garden-front to gentlemen's seats. In Surrey, Kent, Middlesex, and in Wilts, Somerset, and other of the western and south-western counties of Jones added garden-fronts to pre-existing mansions, and designed others, always with garden-fronts and gardens. We note these remarkable facts, but we do not wonder at them, because the great architect was a master of landscape as well as architecture. We find nothing at all approaching to modern gardening much earlier than the reign of Elizabeth. Extensive parks and groves and grottos were certainly laid out, and ponds and lakes were formed, but the physic garden and the vegetable garden had the predominance over the flower-plot.

Extensive orchards for several centuries were common to England, and we find vineyards here and there through the country were cultivated, some hundred of years previously to any mention of a flower-garden, or of even a garden, ordinarily speaking. In the sixteenth century the flower-garden began to noticeably crop up, and care and taste began to be displayed. During the seventeenth century great progress was made, and before the middle of the eighteenth century, the majority of the nobility of England had large well-laid out (though often fantastic) ornamental gardens, to which architecture and architects lent an invaluable help.

With modern gardening we can pretty clearly trace the association of the architect, more or less through the sixteenth, seventeenth, and eighteenth centuries. During the present century, indeed, we may pretty firmly state, even during the eighteenth century the architect has been inseparably connected with the science and art of gardening in all that contributes to embellishment, economy, and sanitary purposes.

We find mention of a nursery in Ireland so early as 1338, in connexion with the Priory of

Kilmainham, Dublin. In the bardic legends and poetry of the early Irish we find no mention of a garden. The wild flower, untouched in its cultivation by art, is alluded to; but no simile occurs where the word garden or the beauty associated with it in imagery is used. In connexion with the care and protection of bees the word garden occurs in one part of the Brehon Code. We will transcribe that allusion as the one of interest. Bees were considered a most valuable portion of the property possessed by the Celts, and it was enacted, "Whoever plunders or steals bees out of a garden or fort is subject to a like penalty as if he steal them out of a habitation."

Fynes Moryson, a rather close observer, who travelled through Ireland in the reign of Elizabeth, says in his "Itinerary,"—"I observe the best sort of flowers and fruits are much rarer in Ireland than in England, which is, notwithstanding, to be more attributable to the inhabitants than to the ayre" (air). It was certainly not owing to the air or the soil. We may notice here, however, that it was at this period that Sir Walter Raleigh introduced cherries into Ireland. This was their first introduction. He planted them in a garden at Affane, in the county of Waterford. Cider was first made in Ireland,—in Waterford also. In the town of Youghal, in the county of Cork, the potato was first planted in Ireland by that worthy, but unfortunate knight. The house he resided in is still pointed out.

The red-streaked apple, from which the cider in Waterford was first made, was brought from Herefordshire, by a Mr. Reeves, of Torreen, in the seventeenth century. The above facts are of some interest in the annals of British gardening.

One of the most succinct accounts of early English ornamental gardening we find relates to the magnificent palace built at Ewell, in Surrey, by Henry VIII. This palace was afterwards given to the Duchess of Cleveland, the favourite mistress of Charles II. The duchess, who appeared to be more fond of money than flowers, and of court life than country life, had the palace pulled down, and sold the materials. This beautiful seat in Surrey was called Nonsuch, and we are able to get some idea of its gardening grandeur from a description written of it by one Heutzer, a German, who visited England in 1589. Walpole published the itinerary of this traveller:—"One would imagine," says Heutzer, "that everything in the power of architecture to perform had been employed in this work. There were in every place so many statues that seemed to breathe, so many miracles of art that seemed to rival the finest pieces of Roman antiquity, that it might with great propriety be called Nonsuch. It was encompassed with parks filled with deer, delightful gardens ornamented with the greatest profusion, and walks so embowered with trees that it seemed a place pitched upon by pleasure to dwell along with health. In the gardens were many columns and pyramids of marble, two fountains spouting water, one of which had a pyramid whereon small birds perched, whilst the water streamed out of their bills; the other fountain was in a grove called Diana's, where Actæon was represented turned into a stag as he was sprinkled by the goddess and her nymphs. Besides this there was another marble pyramid filled with concealed pipes, which sprinkled all that came within their reach."

Herr Heutzer does not state the style or size of the palace, but we may guess pretty accurately the possible grandeur of the place, as architecture and the other arts were beginning to revive in the reign of Henry VIII.

In the works of Leland and Camden, we have mention of gardens in different parts of the kingdom where they travelled. Leland was born in the beginning of the sixteenth century, and died in 1552. Camden lived a century later. Botanic gardens existed, or were established in England, at a much earlier period than is generally supposed. Within a short distance of Somerton, in Somersetshire, at a place called Lyte's Cary House, the ancient family-seat of the Lytes, a botanical garden was established by Henry Lyte. He was the author of one of our first works on scientific botany, in 1578. Ray, the eminent English botanist, contributed much by his writings and journeys over the kingdom to give an impetus to gardening and the cultivation of new or neglected shrubs and plants. His labours belong to the seventeenth century.

The name of John Evelyn, author of "Sylva; or, a Discourse on Forest Trees," may be here mentioned as one who improved horticulture much, and who introduced into notice many rare exotics. He, too, belonged to the seventeenth century. A rather singular and curious description of his garden at Sayes Court may be found in some of the "Philosophical Transactions." He was a native of Surrey, a county of beautiful landscape, and always and still famous in the annals of gardening in connexion with old and beautiful residences.

We find very little evidence of early gardening in Scotland, except that sort which belonged to priories and monastic institutions. Not until the eighteenth century do any respectable attempts at modern gardening appear to have been made across the Border.

Apple plantations, or orchards, comprised but a few species of fruit, interspersed with some common kind of pruniferous trees, plum and damson, but more particularly and extensively the black cherry. Cherry orchards and nut plantations, however, have been long common in England and Ireland; parks and deer parks, fir and oak plantations, artificial lakes, wells, physic or medicinal gardens, we find in connexion with some of the Scottish palaces, religious houses, and universities, but at a much later date than in the sister kingdom.

That order of shrubs or trees that come under the class called evergreens was not brought together, arranged, nor cultivated in Britain until recent times. We only find mention of them in a detached way in any of our early chronicles; but flowers, flowering shrubs, hothouses, and exotics, and the building appliances necessary for their cultivation, are of recent introduction.

"The Carse of Gowrie," once esteemed the most beautiful spot in Scotland, and "a perfect garden," is merely an elongated plantation extending for several miles on the north side of the River Tay, between Dundee and Perth. The word "Carse," which is Scotch, signifies low, flat, fertile land. What it was centuries ago, we have no evidence to show, but at the present day in the summer time, nature bestows on it more attractions than man. At a place called Drumlanrig, north of Dumfries, the Duke of Queensbury's mansion had in the last century something approaching Chatsworth, in Derbyshire. It was adorned with grand avenues, gardens, and terrace walks. Hanging gardens were there cut out of the rock down to the river, adorned with waterworks, and grottoes, with plantations of oak several miles in length. The extravagances of some of the eighteenth century poets in England were imitated both in Ireland and Scotland, and Hales Owen, in Shropshire, the seat of Shenstone, was the model that many of our eccentric grotto-and-garden-mad innovators followed.

Nymphs, syrens, centaurs, phœnixes, antidiluvian beasts and birds, and other nondescript and extinct mammals; mollusca, fossils, and petrifactions, were pressed into service, with twisted snake fountains, and twisted trees, and surrounding alcoves, and gods and goddesses doing penance in their nudity. This gardening monomania continued down to the beginning of the present century, until sober architectural sense stepped in and put a flat upon it.

This brings us down to the period of scientific and practical gardening in connexion with improved dwellings and ornamental and artistic appendages and surroundings; in fact, architecture and gardening more closely allied, and its scope in the present century, and even prospectively.

The construction of greenhouses, conservatories, forcing-houses, hot-houses, orangeries, pineries, &c., attached to or apart from dwelling-houses, calls in these days for the special assistance of the architect, not only in their design and embellishment, but in their sanitary aspects—of heating, ventilation, water supply, and position.

It may be seen that the acquirements of the modern architect are widening yearly, and his practical and professional duties enlarging. Taking a broad view, as far as possible, into the future, with the light of present tendencies, we can foresee no cause for jealousies of one profession with another. Each profession is indispensable to each, and the knowledge that is necessary to build is also necessary to beautify, whether it is connected with a garden, a building, or a nation.

Conservatories and hot-houses which in modern days have to receive some attention at the h[illegible] of the architect, at least in their design a[illegible] construction, were of late introduction into the country.* Barrington, who writes of the subject, thinks there were no hothouses in England earlier than 1667. In Ireland it is reported that fruit was forced in hothouses in the reign of James II., in the town of Blessington. We must add that these gardens were laid out by an English gentleman of Byflet, in Sussex. He fled to Ireland to escape the persecution of Cromwell, and we have further learned from Irish authorities and personal investigations, that pineapples were first grown in Dublin by a Mr. Bullen, a native of Westmoreland. Bullen settled in the vicinity of Dublin, in the reign of Queen Anne, and traces of his gardens were still to be seen at the top of New-street. Many years ago Bullen cultivated a nursery, which was formerly held by a person named Rowe, apparently another Englishman, and he was extensively patronised by the nobility and gentry in laying out their gardens.

Frequent mention is made in English histories of bowers and grottoes. These accounts date back for several centuries; such, for instance, as Rosamond's Bower at Woodstock. Sometimes these were mere mazes or labyrinths; at other times they were vaults or caves; a little grotto-work or excavation within, and a headdress of foliage, rockwork, and interlaced branches without. The geometric and architectural style of gardening cultivated in Italy flourished for awhile in France, and was imitated in England with some success; but what was called the English or more natural style superseded it in the eighteenth century. Arboriculture, as we have previously remarked, received attention first in this country, and we are inclined to believe it was so from the earliest times in other countries. Several parks in Great Britain bear traces of being laid out on a geometric plan; the roads or avenues by which they are intersected supply us with the theory we advance, as well as with the fact. Greenwich, which is a very old park, dating back to the time of Edward I., shows lines of trees intersecting it, concentrating to one or more points. Its ancient lines of chestnuts, many of which, we doubt not, shaded Elizabeth or her predecessors, converged centrally in parallel rows. Evidences of a like arrangement are also, or were, traceable in Richmond and other English parks whose names we just now forget, but which we remember to have seen.

Some of the Roman roads in Great Britain were planted with parallel rows of trees. One remarkable instance occurs to our mind in the town of Dorchester. The Romans were given to the plantation of trees, in connexion with their architectural edifices, and trees of different odours were mixed. It would appear that they were also chosen for their assimilation of colours, as well as perfumes. The Romans studied effect in their plantations, as well as their buildings; and their gardens, as well as our own of the present day, were cultivated to give a rich charm to the site of many of their buildings. Alexander Pope, at Twickenham, and Joseph Addison, at Bilton, near Rugby, were among the first who, on a small scale, showed successful examples of modern gardening in England in connexion with their residences. It would exceed the scope of this article to give a detail of the different places throughout England where gardening was successfully carried out from the commencement of the eighteenth century. The first modern attempt at decent gardening in Ireland was, we believe, made by Dr. Delany, the friend of Swift, at Delville, near Glasnevin, Dublin. Swift gives a humorous and inimitable description in one of his poems of Delany's little garden. Addison, when Secretary in Ireland, was fond of gardening; and, if we mistake not, the Botanical Gardens at Glasnevin, famous once as the resort and haunt of Swift, Addison, Delany, Sheridan, Parnell, and Tickell, all poets, were the rudiments or beginning of this now celebrated botanic garden. Dr. Smith, in his "History of Waterford, mentions that at Listerne "There is a large and beautiful canal, at the further end of which is a *jet d'eau*, that casts up water to

* According to Pliny, it would appear that hotbeds were known and used in his time. We learn from him that hotbeds were made on frames which were kept turned to the different aspects of the sun during the change of the season. The gardeners of the Emperor Tiberius supplied him by these means with cucumbers all the year round; and we learn that the emperor was extremely fond of this sort of fruit.

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Anglo-Indians able height." Here was the principle cessary to odern fountains at play in the eighteenth additions y. We have another account of a very l garden that existed in the county of Cork. It consisted of fourteen acres enclosed with a high wall; two acres were appropriated to a nut-grove. It had a large fishpond, a bathing-house, monstrously high yew hedges and some laurel ones; these were cut into fantastical forms, obscuring the rays of the sun. Here were also large grass plots in various figures." In Thomastown, in Kilkenny, there were hanging gardens (pensile) which were laid out in the time of Charles II. They were formed into terraces upon the side of a hill, and were ornamented with statues. A fishpond lay under, and "a verdant theatre," or large even space, was provided for dramatic entertainments. In the reign of Charles I. gardens began to receive the attention of the Legislature. An Act was passed in this monarch's reign to protect gardens and their productions. This Act was entitled "An Act to avoid and prevent divers Misdemeanors in idle and lewd Persons, in Barking of Trees," &c. This Act did some little good for both countries. Joseph Cooper Walker, an Irish writer of note in the last century, furnishes us in his essay on "The Rise and Progress of Gardening in Ireland," some interesting particulars. In an unedited account of a tour through Ireland, written by some anonymous traveller in 1634, and which was in Mr. Walker's possession, the following account of Lord Chichester's garden at Carrickfergus appears:—"The only grace of this towne (said the MS.) is the Lord Chichester's house, which is a verye statelye house, or rather like a prince's palace, whereunto belongs a statelye gate-house and graceful terrace and walke before the house, as is att Denton, my Lord Fairfax's house. A very fine hall there is, and a statelye staircase, and faire dineing-room, carrying the proportion of the hall. Fine garden, and mighty spatious orchards, and they say they have good store of fruite. I observed on either side of this garden there is a dove-house, placed one opposite to the other in the corner of the garden, and twixt the garden and orchards. A most convenient place for apricots, or some such tender fruite, to be placed against the dove-house wall, that by the advantage of the heate thereof they may be rendered more fruitfull, and come sooner to maturitie; but this use is not made thereof." Hot-houses, it would appear, had not yet been introduced into Ireland, or Lord Chichester would probably have availed himself of their advantages. In Sir Hans Sloane's preface to a "Voyage to Madeira and to Barbadoes, St. Christopher, and Jamaica," we have further particulars of the use of modern gardening in England and Ireland. Sir Hans Sloane brought a great variety of plants to England, and his example induced Sir Arthur Rawson to send out a gardener to those islands to collect a variety. This being successfully accomplished by a man named Harlowe, they were planted at Moira, in Ireland, and flourished. Then Mr. Harlowe built a stove at the seat of Lord Moira, and many tender exotics and flowering plants and shrubs were cultivated. A colony of Huguenots, who settled in Dublin, established a Florists' Club, for the purpose of furthering the cultivation of flowers in Ireland. They gave premiums to the members who raised the most beautiful specimens. They met at stated times at a tavern called the Rose Tavern, in Dorset-street (then Drumcondra-lane). This club continued in existence until the close of the reign of George II. These Huguenots certainly spread abroad a great taste for flowers, and we must forgive their fantastic extravagances in view of what they did. The Huguenots introduced, and their followers plied the shears with a vigour and a vengeance. Box borders, yew trees, all trees, hedges, and shrubs, were cut into fantastic shapes and figures. High walls were built, and streams and ponds were twisted into conic sections, and made to play all sorts of vagaries. The French and Italian mode of gardening, which was practised for long years in England, was introduced by the English into reland, and it lasted down until the arrival of illiam III. in Ireland. Then what is called e Belgic style began. An example of this kind rished for some years in the Royal Gardens existing at Chapelizod, near Dublin. Early e eighteenth century an overseer was ted for these gardens, and he was con- dignified enough to be placed upon the ablishment with a salary of 120*l.* per The successors of the Huguenots, King ollowers, we have shown cut strange evolutions in gardening. They cared not for sunk fosse or fence: enclosures more like prison walls than aught else hid from the sight of the poor all sight of their demesnes and gardens. This was hardly associating gardening with architecture. Whatever little love of the beautiful was in their souls was of a rather selfish kind, but the days of public parks and botanical gardens were in the womb of time. A good time was coming for the people at large and God's poor.

The way to harmonise gardening and arboriculture with architecture is not by cutting trees or twisting them into monstrous and fantastic figures and forms, such as men with their arms in various positions, cut in yew and box and the figure of a colossal goose in the latter. This was to be seen in the last century in Dublin, and in a garden in the county of Meath, the representation of a large cock with bristled feathers cut in yew; or, again, in Dublin, a hare-hunt and a boar-hunt in box. At Bishop Fisher's Palace, in Drogheda, at a far earlier date, we have mention made of the following words:—"O man, remember the last great day." The bank where the letters appeared was bare; the proportion, it was said, of the letters was framed and cut in grass. At the present day, at many railway stations over England and Scotland, the traveller may observe little cultivated patches of garden, on which the station-master or his assistants exert their powers, prosaic and poetic, in forming borders, or tracing in large letters the name of the station. Sometimes it is in shell-work, flints, or stones; more often in flowers, or flowering plants. We mention these instances as a proof how strong the love of flowers and ornamentation is in the British mind.

Proper gardening requires the exercise of a cultured taste; and to harmonise it with architecture no fantastic tricks must be played. Plants and flowers, trees and shrubs, must be helped to grow where they are not; but no silly or violent contortions of bastard cultivation should be allowed to reign. Beautiful arrangement and combination are allowable in garden, park, or pleasure lawn, guided by a good taste, and an appreciation of the true harmony of nature's colours. The natural assimilation and fitness of things must be studied in dealing with nature as with art, or incongruity and a revulsion of taste and feeling will be the result experienced by the cultured mind.*

Gardening as an art deserves a fuller recognition from mankind than it has ever yet received. An English writer of the eighteenth century, Wheatley, says,—"Gardening is entitled to a place of considerable rank among the liberal arts. It is superior to landscape painting as a reality to a representation."

Speaking on the pure association of architecture with gardening, Lord Napier in his recent lecture "On Architecture in India," says,—"A feature in the Saracenic architecture, peculiarly attractive, is the sympathetic manner in which it associates itself with gardens and trees, and with all the forms of natural scenery. For parterres, of the regular kind, the geometrical patterns peculiar to the style, supply an exquisite framework, while the cypress and the plane, the types of aspiring and spreading vegetation, appear to be repeated with a sort of rhythmical concord in the minaret and cupola. It is not in the power of all to admire these harmonies beside the rushing torrent of the Bosphorus, or on the slopes of the Bythinian Olympus, at Cairo, where the caliphs sleep between the city and the desert, or where the dust of Shah Jehan and Mouмtaza Mahal rests under an incomparable canopy, near the waters of the Jumna; but go to the fruit-garden at Seringapatam, go to the grove of tamarinds and palms beneath the rocks of Vellore, where the funereal repose is accompanied by the muttered Koran, and the murmur of waters from the well. There you will still feel how the voices of nature and art, of beauty, and divinity, and death, are blended by the Mussulman builders."

Since 1800 gardening has made a rapid advancement in England and Ireland, and the establishment of flower and horticultural shows in several of the principal towns in the k dom has given it a powerful impetus. The architect, too, has become more of the gardener, and one art has been a great assistant to the other. Gardening has been, through the architect, a sanitary agent, and architecture has assisted gardening to cultivate with more precision and to greater perfection. Warming and ventilation, water supply and drainage, are now parts of the study of the architect as well as the gardener, and in arboriculture as well as horticulture the foresight and judgment of both the architect and landscape-gardener may be profitably employed. The growth of useful timber is a consideration that ought not to be neglected. The gardener may know of their slow or rapid growth, and of their paying value when fit for felling. The architect knows, or ought to know, their building value for architectural and mechanical purposes. Some timber is only required for temporary building purposes; others for permanent uses. Scaffolding timber includes one sort; carpentry or joinery materials another. Besides these, there are other sorts used in mechanism, tools, vehicles, and various farming and domestic uses. Native-grown timber is, however, at present rather circumscribed in its building uses, owing to the almost inexhaustible forests still existing abroad. The architect, it may be seen, if he be true to his mission, must of necessity, as the world progresses, be more than a designer of houses. It will not do to have only a perfect acquaintance with styles and orders, but he must be more or less conversant with the order of Nature. "*To build*" has a wide signification; it may apply to the elevation of an art, a science, or a nation. It is a component part of civilisation and progress, and it must therefore comprise the true accompaniments of architecture.

We might, if it were desirable, enumerate several instances of modern natural English gardening where it has been associated with architecture, and where both in conjunction truly harmonised; the gardens and landscape adding beauty to the architectural structure, and it, in its turn, reflecting the charm of site and surroundings, being at the same time the central and primal object. The examples of artistic modern gardens may be instanced, as those at Claremont, Stowe, Esher, Woburn Farm, and others. Of botanic gardens, there are many good examples that might be pointed to in the kingdom. Kew, of course, Eaton Hall, Chatsworth, Trentham, and some smaller ones. Her Majesty's gardens at Frogmore are instances of well-cared-for and well-arranged forcing and kitchen gardens, where the latest improvements have been advantageously carried out.

One other point may be alluded to;—the rise and growth of window-gardening in cities. This is an art that the architect should commend and aid, particularly in overcrowded cities. Flower-pots, in the windows of the poor, filled with flowers and breathing a rich perfume in many of our courts and alleys, is not only a pleasing and exhilarating sight to the pallid and weary-worn worker, but it is without doubt a useful disinfectant. Window gardening should be encouraged among our working classes, and every facility should be given to the growth of flowers. The life of flowers in the dwellings of our people is human care and human purity. If these conditions exist not, window gardening is not only a failure, but a nuisance; for the neglect of flowers, like the neglect of the poor man's children, will end in disease and decay.

In the interest of human happiness and sanitary science we sincerely trust that the love of flowers may always exist, and that the art of gardening in all its branches, from the landscape to the window-cill, will grow and blossom, and bear further fruit in its honourable association with the future of architecture.

* The names of English architects who appear to have paid more or less attention to gardening wants and purposes in designing their buildings are Inigo Jones, Webb, Sir Christopher Wren, Sir John Vanbrugh, Sir William Chambers, Colin Campbell, Nash, and some others whose life and labours belong to our own time. Perhaps we should be remiss in not adding here two other names, that of Loudon and Lindley, an Englishman and a Scotchman, and co-labourers. Though not architects, but practical and scientific gardeners and botanists, they have raised their profession above reproach, reflected honour upon their country, and linked gardening to architecture by their labours.

ALBERT HALL AND THE INTERNATIONAL EXHIBITION BUILDINGS.

We supplement our recent notic Albert Hall of Arts and Sciences and t Buildings for the International Exhibi 1871 * with a plan, showing part of the and their connexion by means of the Co tory of the Royal Horticultural Society w Albert Hall. The new buildings, as we are at the back of the arcades, on eacl the Horticultural Gardens.

* See p. 977, *ante*.